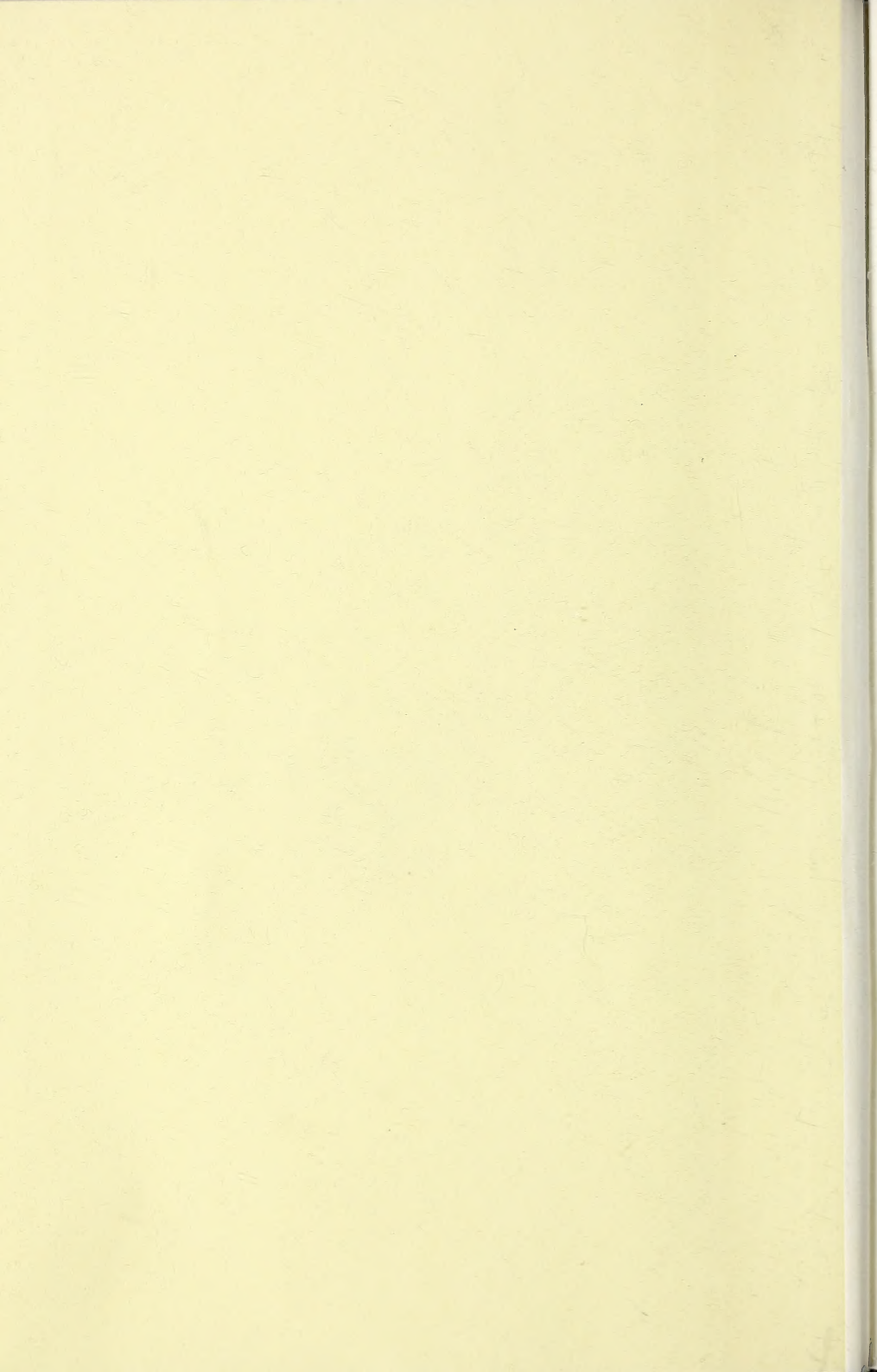


S.36A



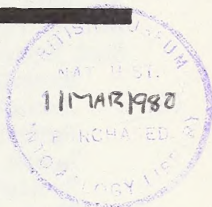


VOLUME 38



1979

**THE
BULLETIN OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**



Edited by
BRIAN O. C. GARDINER, F.L.S., F.R.E.S.

Index compiled by
PAUL SOKOLOFF, M.Sc., M.I.Biol., F.R.E.S.

The Amateur Entomologists' Society
355 Hounslow Road, Hanworth, Feltham, Middlesex

GENERAL INDEX

- Aculeate Hymenoptera from Sussex, 69
Angle-shades moth : colour variation in larvae of, 171
Ant-lions of NE Nigeria, 52
Ant-lions : pit making, 57
Arabian novelty, 126
Ardennes, September 1978, 188
Behaviour of Hymenoptera, 14
Book Reviews:
 Butterflies on My Mind, 17
 Aberrations of British Butterflies, 18
 Planning and the rural environment, 19
 Insects are animals too, 19
 Spotter's guide to butterflies, 20
 The pollination of flowers by insects, 21
 The Aurelian, 21
 The life of the Bumblebee, 22
 Wild silkmoths and how to rear them, 67
 Life on forty acres, 67
 Windowsill ecology, 115
 A Dipterist's Handbook, 116
 Record of my life work in entomology, 117
 World of butterflies : a pictorial map, 118
 Insects on stamps, 119
 Conservation and agriculture, 161
 Trichoptera : Hydroptilidae, 161
 Invertebrate rearers handbook, 162
 The colouration, identification and phylogeny of *Nessaea* butterflies, 162
 Fenland : its ancient past and uncertain future, 163
Brazilian flies (unpleasant), 180
Massif Central, 74
Mites and bees, 159
Mole cricket, 181
Moth trapping — effects of, 6
 — unusual creatures during, 29
Nigeria collecting trip, 166
Northamptonshire notes 1978, 144
Orange Tip, long lived, 11
Pine Processionary observations, 164
Poems, 15, 105
Pupae in birds nests, 86
Recording in Oxfordshire, 9
Reprints, 178
Reports:
 Exhibition 1978, 45
 Midlands Fair, 115
 Council for 1978, 149
 Treasurer for 1978, 150
 EEG, 156
 IBASG, 156
 JCCBI, 157
Rocky Mountains, collecting trip, 36

Ruby Tiger, 141
Salisbury Lepidoptera, 68
Sardinia Lepidoptera, 96, 136
Sierra Leone adventures in, 145, 191
Silpha atrata, 8
Southern Aeshna, late, 12
Spring usher, collecting females, 142
Buff-tip : sexual dimorphism, 171
Butterflies:
 in Glasgow, 14
 Tortoiseshells, 12, 143
 Scarcity of Comma, 15
 Comma : on hop, 16
 White-letter Hairstreak, 41
 Scotch Argus, 44
 Speckled Wood, 68
 Purple Emperor, 89
 and Spotted Flycatcher, 93
 Holly Blue : variation in numbers, 95, 170
 Feeding Habits, 194
Collecting : justification, 2
Cylinder cage, collapsible, 131
Death and metamorphosis, 22
Defoliation by Lepidoptera, 69, 143
Derbyshire Lepidoptera, 26
Dolbina elegans — origin?, 140
Editorial, 1, 105
Essex Emerald, 158
Extinction and conservation, 90
Fossil insects, 10
Grease in Lepidoptera, 106
Hampshire lepidoptera, 108
Hornets : observations on, 3, 129, 131, 170
Insects from a gall of Biorhiza pellida, 124
Italy : Lake Como, 106
Italy, Rhopalocera, 185
Lacewings and bees, 134
Leopard moth in Cheshire, 14
Letters to the Editor, 1, 139
Stag beetles, observations on, 95
Storeboxes, make your own, 122
Volucella zonaria, observations on, 3
Wildlife reserves, 11
Wokingham Lepidoptera survey, 60
Wood-wasp in Hampshire, 14

CONTRIBUTORS

- Airy Shaw, H.K., 116
Aquilina, C., 68
Archer-Lock, A., 41
Carter, D. J., 107
Caswell, W., 145, 191
Chapman, G., 95
Collins, T.A., 26
Cooke, N. H., 151
Cooter, J., 131
Cope, R. D., 14
Craik, J. C. A., 129
Cribb, P. W., 17, 74, 89, 117
Davidson, J. H., 2
Defoe, N., 134
Downes, J., 171
Edwards, M., 69
Ellis, S., 166
Eschbacher, C., 156
Gange, A., 68, 69, 143
Gardiner, B. O. C., 1, 21, 67, 105, 118, 119, 162, 170
Gardiner, C. J., 115, 188
Gossling, N. F., 96, 136, 183
Hadley, M., 131
Hanson, M. W., 90, 180
Hart, C., 19
Hatcher, P., 108
Henwood, G., 52
Hilliard, R. D., 45
Hynd, W. R. B., 161
Irwin, R. R., 36
Keen, D. R., 12, 157
Knight, R., 9
Kocyszko, J., 11
McCann, F., 14, 141
MacFadyen, T., 106
Majerus, M. E. N., 7, 29, 86, 171
Martin, P. A. 11, 42
Maythil, R., 22, 57
Moseley, K. A., 2, 8, 10
Orpin, C., 30
Parsons, M., 142
Parsons, M. M., 156
Payne, J., 144
Pittaway, A. R., 126, 140
Plester, L., 16
Rees, D., 60, 95
Richmond, L., 68
Samuels, K., 12, 143
Shirley, P. R., 124, 143
Simpson, M. S. L., 44, 68
Sinden, R., 170
Smith, D. A., 122
Sokoloff, P. A., 19, 22, 67, 149, 162
Stallwood, B. R., 3, 14, 15, 93, 164, 194
Tilley, D. A., 181
Watkinson, I. A., 20
West, H., 170
Williams, J. R., 14
Wurzell, B., 115
Young, C. A., 139

S 36 D
VOL. 38 NO. 322



FEBRUARY 1979

**THE
BULLETIN OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**



**WORLD LIST ABBREVIATION:
BULL AMAT ENT SOC**

**EDITOR:
BRIAN GARDINER FLS FRES**

The Amateur Entomologists' Society

(Founded in 1935)

President :	P. G. TAYLOR, F.L.S.	19 Colway Road, Hounslow, TW4 5LL.
Hon. General Secretary :	P. A. SOKOLOFF	4, Steep Close, Orpington, Kent. BR6 6DS.
Hon. Bulletin Editor :	B. O. C. GARDINER	c/o ARC Unit, Dept. of Zoology, Downing Street, Cambridge.
Hon. General Editor :	P. W. CRIBB	355, Hounslow Road, Hanworth, Feltham, Middx.
Hon. Treasurer :	N. H. COOKE	The Pass House, Kilmahog, Near Callander, Perthshire.
Registrar	Mrs. B. W. KEEN	3 Woodbourne, Farnham, Surrey GU9 9EF.

where to write

Subscription renewals (£3.00 p.a. or £2.00 under 18) :	B. R. STALLWOOD, 7 Markall Close, Cheriton, Alresford, Hants. SO24 0QF.
First subscriptions, (£3.50 or £2.50 under 18), changes of address, non-arrival of Bulletins, member- ship applications and records :	REGISTRAR Address in list above
Manuscripts, drawings and Books for review :	B. O. C. GARDINER, Address in list above.
Advertisers :	R. D. HILLIARD, 18 Golf Close, Stanmore, Middx. HA7 2PP. (01-954 0460)
Exhibition matters :	B. F. SKINNER, 5 Rawlins Close, South Croydon, Surrey, CR2 8JS.
General enquiries :	P. A. SOKOLOFF, Address in list above.
J.C.C.B.I. representative :	D. KEEN, 3 Woodbourne, Farnham, Surrey, GU9 9EF.
A.E.S. Conservation Group :	D. LONSDALE, Forest Res. Stn., Alice Holt Lodge, Wrecclesham, Farnham, Surrey, GU10 4LH.
A.E.S. Exotic Insects Group :	C. J. ESCHBACHER, 38 Frith Road, Bognor Regis, Sussex, PO21 5LL.
A.E.S. Insect Behaviour and Ants Study Group :	M. M. PARSONS, 95 Glebe Lane, Barming, Maidstone, Kent, ME16 9BA.

The Observer's Book of INSECTS OF THE BRITISH ISLES

By E. F. Linssen,
F.Z.S., F.R.E.S.

A pocket guide to the 25 orders of insects found in the British Isles, using up-to-date classification methods as accepted today and including a useful key to all the British insect orders. A section on spiders is included because of their inter-relationship with insects. Colour illustrations, photographs and line drawings.

£1.25 net.

Frederick Warne
Warne House, Vincent Lane,
Dorking, Surrey, RH4 3FW.

Official Publications Agent

L. CHRISTIE

HAS MOVED TO

129 FRANCISCAN ROAD,

TOOTING, LONDON,

SW17 8DZ

(Postal business only)

**Members of the Entomological
Suppliers Association.**

DATA LABELS

Printed to your requirements
in any quantity of labels/lines.
Choose from a variety of paper
surfaces and typefaces.
Full details and sample
labels on request.

P. D. J. HUGO

**38 Cotswold Crescent,
Chipping Norton, Oxon.
OX7 5DT.**

*Please mention this Journal
when replying*

BEE RESEARCH ASSOCIATION

Hill House,
Chalfont St. Peter,
Gerrards Cross, Bucks.
SL9 0NR

For Scientific and technical
information on Bees (Apoidea)
especially Honeybees (Apis SP)

Please write to the above address
for details of publications and
membership. A specimen copy of
"Bee World" is obtainable for
50p.

Member
of the
Entomological
Suppliers'
Association



Worldwide Butterflies Ltd

Open to Visitors Daily 10 - 5 incl. weekends
APRIL TO OCTOBER

**BUTTERFLIES IN A STATELY HOME FLYING AND
BREEDING IN TROPICAL PALM HOUSE
AND NATURAL JUNGLE**

Collections from across the World

FREE CAR PARKS

REFRESHMENTS

BOOKS SPECIMENS EQUIPMENT LIVESTOCK

Situated on A30 Sherborne - Yeovil dual carriageway

Send stamped addressed envelope for price list of
livestock, Entomological equipment, Specimens and Books

Worldwide Butterflies Ltd.

Compton House, Sherborne, Dorset. Yeovil (0935) 4608



EDITORIAL

The experiment of holding our Annual Exhibition at Wembley Conference Centre was well worthwhile and in many people's view was a huge success, marred only by frustrating and long delays for those unfortunate enough to be using the dreadful and notorious North Circular Road as an approach route. The much larger premises gave far more freedom of movement between the exhibits and stalls although this was in fact at the expense of there being no more actual exhibiting and selling space. The facility of a licensed bar no doubt suited some, but there did appear to be rather a shortage of seating space. To those who considered the date to be too late in the year, your editor met others who were pleased to be able to attend (for the first time) just because the date was late in the month. The numbers attending, while rather difficult to estimate, appear to have exceeded 3,000, many of whom of course were the families of members. A full report of the exhibits will appear in a later issue. Meanwhile the problem of a venue for this year remains.

**STOP PRESS ANNOUNCEMENT — THIS YEARS EXHIBITION
WILL BE HELD IN THE PALM COURT HALL, ALEXANDRA
PALACE ON SATURDAY SEPTEMBER 15TH.**

LETTER TO THE EDITOR

Dear Sir,

In reply to Hugh Clarke's letter in the May 1978 issue, may I attempt to explain why collecting may sometimes be necessary.

The prime reason for collecting ought to be to enable accurate species determinations to be made in order that accurate distribution records be obtained. While identification of Lepidoptera in the field is usually relatively easy, this does not apply to many other more complex orders where resort to microscopic examination is frequently necessary. It may also be desirable when recording a difficult genus, such as *Bembidion* (Coleoptera), to be able to retain set specimens for checking of determinations by a specialist in the genus.

As far as photography is concerned, while this may be easy and convenient for lepidopterists, the smaller sizes and specialised habitats found in other orders require more expensive and complicated equipment, with-

out in most cases being of any value for accurate identifications.

In summary, Hugh Clarke's argument against collecting, while it may be valid for the intensely studied and over-collected (particularly with mercury vapour lamps) macrolepidoptera, seems to me to fail to understand the problems and objectives of entomologists interested in other orders.

Yours sincerely,

John H. Davidson.

COLLECTING IS JUSTIFIED . . . SOMETIMES

Much as I hate to add to this already 'overaged' controversy that has been raging for many years I feel, following a recent letter by Hugh Clarke, that I can stay silent no longer.

Whilst I can agree with Mr. Clarke's first and second points to some extent I feel that I must nevertheless criticise his alternatives stated in his third point. In this day and age the 'inescapable facts' are:

(1) Photography is expensive whilst collecting remains relatively cheap. I am not suggesting here that everyone should go around weighing up the cost effectiveness of every insect they wish to collect/photograph; However the fact remains that the cost of camera equipment suitable for photographing insects is astronomical, and far beyond the financial reach of some members, especially juniors. On the other hand, the cost of a few setting boards, pins and storage boxes is much less. Thus I can see collecting carrying on for many years to come simply because, armed with the highest motives in the world, the average entomologist's decision whether to collect or photograph is affected by one factor only; the amount of money in his pocket. And who can blame him?

(2) Many people involved in the serious study of entomology find that neither their eyes nor the camera is sufficient to accurately identify many insects, especially those belonging to orders other than Lepidoptera. I challenge anyone to produce photographs that show the difference between the two Carabid beetles *Nebria brevicollis* Fab. and *Nebria salina* Fairmaire. These two insects like many others are only separable on a detailed inspection using a moderate power microscope, and they have to be killed to do this successfully. Many insects are more difficult still, being separable on genitalia inspection which again requires killing the insect. In many cases it is essential to be able to separate closely related species like those mentioned above, even for ecological surveys carried out for conservation reasons. The camera may be sufficient for most Butterflies and Moths but for many insects it is a woefully inadequate medium.

Keith A. Moseley (4733)

OBSERVATIONS ON *VESPA CRABRO* L. (HYM. VESPIDAE) — THE HORNET AND *VOLUCELLA ZONARIA* PODA (DIPT. SYRPHIDAE)

Introduction

As these two fine insects seem to have become scarce in recent years I thought it would be interesting to record some observations made in the decade 1943-1953 when both were fairly common.

Whereas *V. crabro* is indigenous, *V. zonaria* is a migrant from Europe, odd individuals of which have been recorded as far back as 1870 but by about 1943 they became more numerous and appeared to have established themselves in the South of England. At the same period *V. crabro* also became fairly common, and the fact that their life-histories are inter-related, may be the reason (i.e. the increase in *crabro* provided more hosts for *zonaria* and helped it to establish itself). In the same way, both, as far as my own observations are concerned, have become scarce since 1953.

VESPA CRABRO

Apart from its large size, the hornet is easily distinguished from the common wasps by its colouration, where the black markings of the wasps are replaced by reddish-brown. It is quite fast on the wing and tends to fly in a straight line.

Habits — Nests

Evidence has shown that *crabro* nests usually in hollow trees, over several years, and an interesting description is found in Whitakers' Almanac for 1949 in which part of the Epping Forest Survey by members of the London Natural History Society deals with habits of hornets in that area. An early discovery was a series of old nests in a hollow log. Beneath 3" of mould was a layer of dead hornets and their nests, below which was 6" of mould over another layer of the same, beneath which again was 12" of mould over a final layer of hornets and nests.

In 1946, I had a similar experience (Stallwood 1947) when, after an August gale, an oak tree was blown down on Surbiton Golf Course, Hinchley Wood, Surrey. The hollow trunk had broken off at a point where there was an active nest, exposing it undamaged. It remained so for some days with the occupants busily flying in and out. However, some misguided individual finally destroyed it to reveal remains of several earlier nests beneath.

The LNHS Survey also noted that at certain times of the year hornets fed on white tree-flux, cleaned themselves after eating, and thus spread this blight in healthy trees. This appears to be about the only damage they cause, as they are otherwise mostly beneficial by preying on flies and other insects. The Survey also maintained that hornets were commoner than they appeared to be, and a swarm (a rare phenomenon) was discovered in Woodford, Epping Forest on VJ-day in 1945.

Nocturnal activity has also been recorded. Baird (1858) remarks that hornets, unlike most insects, carry on the labours of nest-building by moonlight. A contributor to the Hants Field Club (1944) reports hornets feeding from a wounded oak at dusk, and there is also a reference by Platts (1959) of the insects feeding at a damaged oak in the New Forest from dusk to 10 p.m. in 1946 and 1947. An instance of an individual being attracted to m.v. light-trap is recorded by Siggs (1958).

Stings

There appear to be few records of the result of hornet stings. One person who was stung (Hants Field Club 1946) describes it as "no worse than a mild bee-sting, but half an hour afterwards intense itching develops all over the body from head to foot, lasting about an hour and then passing off, although, of course, the sting may affect other people differently." In any case the insect is generally considered to be less aggressive than the common wasps, and I have stood within a foot or two of an active nest (described above) with the inhabitants shooting in and out, without coming to any harm.

Food of the Adult

In addition to insects, trees bored by the larvae of the Goat Moth (*Cossus cossus* L.) and exuding sap are particularly attractive to hornets usually in company with nymphalid and satyrid butterflies, small wasps, flies and microlepidoptera. I have quite a few personal records of these incidents in Surrey and Middlesex in the years 1943-50, not only in woodland, but in one instance a few yards from a main road in Twickenham. Other personal records of feeding include, ripe crab-apples and the flowers of ragwort, michaelmas daisy and ivy. Undoubtedly it is attracted to other fruits and sweet distillations, but is rarely numerous enough to be a nuisance, unlike its smaller relatives.

Abundance and Scarcity

It has been recorded by Rothschild (1946) that at Ashton Wold the period 1900-23 was especially good for Hymenoptera, but the hornet was absent. It first appeared there in 1940 and in the following seven years had increased steadily and in 1945, sufficiently numerous to prove tiresome during the plum harvest. It would appear, then, that the insect has cycles of abundance and scarcity like many butterflies and other insects.

From other records as well as my own it seems that the increase commenced c. 1940 to become scarce again in recent years. My own last sighting was in 1953.

Oddly enough, this period of relative abundance practically coincides with that of *Volucella zonaria*, the syrphid fly whose larvae feed on the nest debris of *V. crabro* and other wasps. (q.v.)

VOLUCELLA ZONARIA — Arrival in England

This outsize hoverfly was first reported in 1870, although according to

Fraser (1955) the first specimen taken in England was c. 1885 by the late Dr. F. Haines at Edenbridge, Kent, and is in his collection, which was housed (in 1955) in Dorchester Museum. From then on odd specimens have been recorded as immigrants from the Continent, but it was not until the 1940's that it became more numerous and to eventually become established, at least temporarily, in the South of England.



According to Balfour-Browne (1953) there seems to be some doubt about the two specimens taken in 1870 and they are now believed to have been taken in Jersey. Undoubtedly, though, *zonaria* established itself in England by coming over from the Continent in small numbers until it found a niche into which it fitted itself, i.e. in the S.E. of England, spreading West and North from there.

Description

About an inch long, *zonaria* is rather startling at first sight and could easily be mistaken for a hornet by the non-entomologist. However, its colouration, yellow and black is in contrast to the hornet's yellow and reddish-brown. Apart from its size it can also be recognised by the striking yellow triangle on the face. It could possibly be confused with *Volucella inana* but this species is smaller and has thinner black bars on the abdomen. Both species have saffroned wings. It usually feeds from flowers in an upside-down position and is especially fond of buddleia on which I have mostly found it, but it is also partial to ivy-bloom, and in Southern France on privet.

Larval food

The larvae live in the nests of hornets and other wasps, feeding on dead wasp larvae and on debris that gathers under the nest. It could be called a scavenger rather than a parasite.

Distribution and Observations

My personal observations of this insect began in 1946 and from then until 1950, several were noticed each year. In 1950, however, up to 20 were counted during July and August. In 1951, from 17th June until 23rd September seven more were seen and in 1952 (July-August) three more were recorded. In 1953 (July-August) 13 were seen, the highest count on one day being five, on 9th July of that year.

Almost all were recorded at Strawberry Hill, Middlesex, and on buddleia, except for one specimen at Beaulieu, Hants., and a couple at Ches-

sington, Surrey. Records from other sources include the Bournemouth area in 1944, when, according to de Worms (1951) "quite a lot were taken". Parmenter (1953) remarked "Certainly *zonaria* would appear to have invaded this country from Europe, colonising the S.E. corner of England". Other records include Kent, Surrey, Middlesex, Herts. and Hants. including that of Ranger (1955).

Summary

Some interesting facts and queries emerge from the above:—

1. *Zonaria's* mimetic (?) resemblance to the Vespidae, and *V. crabro* in particular.
2. The degree of toleration given to *zonaria* when invading nests of Vespidae to oviposit. Does the resemblance play any part?
3. The increase in numbers of both species in the decade c. 1943-53.
4. The subsequent decrease in numbers since that period.
5. The dependence on the nests of Vespidae for larval food by *zonaria*.
6. The possibility that the increase in the hornet population was instrumental in helping the spread of *zonaria*, by providing extra larval food.
7. Lack of records for both species post-1953.

Postscript

I should be interested to know other members' views on the present status of these two insects:

B. R. Stallwood (1547)

REFERENCES

- Anon. (1944). *Proc. Hants. Field Club* 16 (1) 98.
 Anon. (1946). *ibid.* 17 (3).
 Anon. (1949). *Whitakers Almanac* 1014.
 Baird, W. (1858). *Cyclopaedia of Natural Sciences* 575.
 Balfour-Browne, F. (1953). *Entomologist's Gazette* 4 (2) 115.
 de Worms, C. G. M. (1951). *Proc. Dorset Nat. Hist. & Arch. Soc.* 73 202.
 Fraser, F. C. (1955). *Bull. Amat. Ent. Soc.* 14 30.
 Parmenter, L. (1953). *Ent. Rec. & Journ. of Var.* 65 188.
 Platts, J. H. (1959). *Bull. Amat. Ent. Soc.* 18 44.
 Ranger, J. A. (1955). *ibid.* 14 24.
 Rothschild, M. (1946). *Entomologist* 79 175.
 Siggs, L. W. (1958). *Bull. Amat. Ent. Soc.* 17 75.
 Stallwood, B. R. (1947). *Entomologist* 80 119.

A NOTE ON ONE OF THE EFFECTS OF MOTH TRAPPING

Between 1975 and 1977, whilst running a moth-trap in Ringwood, Hampshire to obtain females of one particular species which I required for research, I endeavoured to prevent my activities affecting the moth population unduly by releasing the unwanted captures some distance

away from the trapping area in a similar habitat whenever possible. However, during the early spring of 1977, I came across a phenomenon which I have not previously noted in the literature, and which may be of interest to members.

Purely by chance in March, 1977, I urgently required a small sample of wild larvae of the Angleshades moth (*Phlogophora meticulosa* L.). To obtain these I went out sweeping the vegetation, in the immediate vicinity of my moth trap, at night. The vegetation of this area is made up of tall grasses and a wide variety of low growing plants such as docks, plantains, vetches, chickweeds, etc. Whilst sweeping, I noted that the overall density of larvae (most of which were of Noctuid and Satyrid species) seemed to be greatest immediately around the trap. I thus decided to try to verify whether this was a real or apparent phenomenon by taking samples from set distances away from the trap which is placed in the same position every night.

Four axes radiating directly out from the moth trap, at 90° to each other, were marked out to a distance of 13 metres from the trap. Then, areas, half a metre square were marked out along each axis with a 2 metre gap between each so that there were six areas marked along each axis.

The axes were marked A, B, C and D, and the areas on each axis 1 – 6 inclusive, number 1 being closest to the trap and number 6 most distant from it. The areas were searched very carefully for larvae, and subsequently the herbage and top layer of soil to a depth of about 5 cm was removed and painstakingly sifted for larvae. This method was employed because the larvae of a number of species (e.g. the Large yellow underwing, *Noctua pronuba* L.) are known to bury themselves in the top soil layers during the day.

The number of larvae found for each area was recorded and is given in Table 1. The figures for different axes are to some extent variable, but the totals the four samples from each set distance away from the trap show that there is a considerable drop in the number of larvae per unit area of ground with distance away from the trap to about 10 metres, after which the value seems to level off.

A number of hypotheses may be put forward to explain this phenomenon. Of these two seem more probable than the others. Firstly, larvae may be attracted towards the trap by the mercury vapour light. Alternatively, the fact that many of the moths which are attracted by a mercury vapour lamp fail to enter the trap, but come to rest upon the surrounding vegetation may cause an abnormally large number of female moths to lay eggs in the immediate vicinity of the trap. Other less likely possibilities are that larvae may be attracted by the heat of the lamp, or that the mercury vapour light may affect the surrounding vegetation in such a way as to make it more favourable to larvae, and doubtless other theories

could be formulated. More extensive research will be needed before the position is clarified.

One criticism of the test is that a number of samples should have been taken, at the same time as those discussed above, from an area of similar ground vegetation and surrounding habitat which is not in the vicinity of an artificial light source, to see whether the level-off value of between 90 and 100 larvae per quarter square metre is consistent with the value attained in areas not influenced by a moth-trap.

Michael E. N. Majerus (4027)

Table 1.

Number of larvae taken from each of the sample areas.

Area number	1	2	3	4	5	6	
Distance	0-0.5m	2.5-3m	5-5.5m	7.5-8m	10-10.5m	12.5-13m	Total
from Trap							
Axis							
A	63	42	31	26	27	24	213
B	41	49	29	25	20	19	183
C	49	38	29	29	24	27	196
D	50	42	38	19	26	23	198
	203	171	127	99	97	93	790

AN INTERESTING SPECIMEN OF *SILPHA ATRATA*

On the eighteenth of June 1978 whilst walking in the Clent Hills area near Birmingham I found a single specimen of *Silpha atrata* (L.) on a path.

Subsequent closer inspection revealed an unusual characteristic in this particular specimen, of finer and more diffuse puncturation on the disc of the thorax. This was indeed a confusing feature especially as the thoracic puncturation is considered to be an important character in the separation of *S. atrata* and *Silpha atrata subrotundata* (Leach) by Joy (1932), and my specimen showed *s. subrotundata* affinities according to his key. This situation I felt needed further investigation as my specimen was most unlikely to be *s. subrotundata*, the Clent Hills being well outside the normal range of this subspecies which is found only in Ireland, the Isle of Man and, in sparse numbers, on Scottish isles.

Thus I checked a series of *Silpha atrata* specimens, consisting of ten of each 'type', in the collections at the University of Birmingham. Alas this course of action produced yet more confusion as none of Joy's chosen characters for the separation of *S. atrata* and its subspecies proved to be reliable. At least half of the specimens showed characters of both in individual specimens.

Consultation of European coleoptera literature proved, not surprisingly, fruitless as *s. subrotundata* is confined to the British Isles and thus falls outside the geographical limits of continental works.

The most likely conclusion to draw is that my specimen is simply a departure from the typical form of *Silpha atrata* and indeed Allen (personal communication) points out that this beetle shows considerable variation. Thus the lesson to be learnt from this investigation is that *Silpha atrata* can sometimes manifest some characters of its subspecific cousin *S. atrata subrotundata* and that this fact should always be borne in mind when using Joy's key.

Keith A. Moseley (4733)

REFERENCE

JOY, N. H. (1932). *A Practical Handbook of British Beetles*. H. F. & G. Witherby.

OXFORDSHIRE BIOLOGICAL RECORDING SCHEME

Following the recommendations of the Biological Records Centre of the I.T.E., a local Biological Recording Scheme was started in January 1976 by the Oxfordshire County Museum Service.

The object of the Scheme is to record all orders of Flora and Fauna occurring in Oxfordshire (VC23 and part of VC22) based on a 2 kilometre Tetrad system.

The Scheme is greatly indebted to several Naturalist Societies and Learned Bodies for making their records so freely available. The Scheme, in conjunction with the Nature Conservancy Council and the several local Naturalist Societies has discovered quite a number of sites harbouring collections of local or rare species and is endeavouring to have them declared as sites of Special Scientific Interest, thus affording a measure of protection. Several species of Flora and Fauna not previously recorded in Oxfordshire have been discovered and also a species of Bee not previously recorded in the British Isles. Processed records are forwarded to Monkswood B.R.S. for inclusion in their 10 km Atlases, and records can be made available to individuals or institutions genuinely involved in study projects.

It must be stressed, however, that absolute confidentiality of records is maintained should any recorder desire his information to remain undisclosed.

Despite the wealth of records received in the last 2½ years, it has only served to illustrate that we are merely scratching the surface; therefore I appeal on behalf of the Scheme to all AES members with records of Oxfordshire for their help in the cataloguing of the County.

Both 'casual' and concentrated records stating species, date and grid reference are very welcome. Records of most insect orders are very scant and those of Arachnids are virtually non-existent. As can be expected, the fullest records are for Lepidoptera.

More detailed information about methods of recording, the hopes and aims of the Scheme, Newsletters, etc. are available from John Campbell, Assistant Education Officer, Biological Recording Scheme, Oxfordshire

County Museum, Fletchers House, Woodstock, to which address also, records should be sent. Please don't forget, if you also have an interest in anything from freshwater fish to fungi, please send in a record.

R. Knight (5323)

**THIS INSECT (FRAGMENT) HAS BEEN DEAD LONGER
THAN YOU THINK !**



The accompanying photomicrograph shows the frontoclypeal apotome (that is the plate of chitin that fits in the centre of the face) of a caddis fly larva. This sclerite belongs to the species *Hydropsyche pellucidula* Curtis, a species of caseless net spinning caddis found in medium to slow flowing rivers. The specimen shown is just over one millimetre in width across the anterior margin (the pointed end being the posterior margin) indicating the larva to which the sclerite belonged to be about 5th instar.

What is so unusual about this specimen is that it is a subfossil of Pleistocene age. The apotome shown is about 12,000 years old but sclerites of this species have been recovered from deposits up to 110,000 years old. This is only one of many species of caddis larva found in Pleistocene deposits of varying ages by workers at the Quaternary Entomology Laboratory at the University of Birmingham.

Keith A. Moseley, B.Sc. (4733)

NOTES AND OBSERVATIONS

New Wildlife Reserve in Industrial Setting — During the Summer of 1977, a new wildlife reserve was established in a most unlikely spot in a wood in the heart of industrial North-Staffordshire. It is a co-operative venture between the Staffordshire Nature Conservation Trust and the National Coal Board. The reserve covers twenty acres of woodland, only a stone's throw from the Coal Board's huge Hem Heath Colliery at Trentham. There are twenty-six different species of trees and shrubs in the wood, as well as a wide variety of flowering shrubs. In one afternoon, forty species of beetle were identified in the wood. More than fifty species of Butterfly and Moth were recorded including the rare Alder moth (*Apatele alni* L.) not often met with, and a species of Tortrix never before known in Staffordshire. The reserve is called Hem Heath Wood. The Conservation Trust hopes not only to preserve but increase the level of wildlife there in the future. — Jan Kocyszko (6089).

Long Lived Orange Tip:—Two years ago, on 22nd May 1976, whilst on a Croydon Natural History Society field meeting at Haywards Heath, Sussex, I noted a number of *A. cardamines* (Orange Tip) flying among the Garlic Mustard and Charlock plants, and managed to locate a few ova for rearing.

Knowing that the larvae have cannibalistic tendencies I later made up a number of individual cylinder cages from empty Baked Bean cans and rigid clear acetate film — see my other article (MAKING YOUR OWN CANNIBAL CAGES).

Into each cage I placed a small wet block of "Oasis" material into which I pushed a sprig of foodplant and the stem on which the egg had been laid. After about a week the ova began to hatch into minute larvae

which fed quickly, eating mainly the green succulent seed pods, which the larvae resemble to a remarkable degree.

Eventually the larvae had all pupated by 22nd June 1976, and were then kept in an open meshed emergence cage at room temperature right through the drought period of 1976 and on until 15th June 1977, when the first female emerged. The following day one female and one male emerged, after a period of 358 days, nothing unusual so far, but the last three pupae have remained dormant in the cage until this year, when on 6th March 1978 another female emerged, after a period of no less than 653 days!

Two pupae still remain, but whether they will continue their dormant stage until 1979, who knows?—Peter A Martin (5228).

A Late Southern Aeshna — With reference to Mr. Notton's note in the May 1978 issue of the Bulletin, I would like to say how interested I was to read of such a late record. Although adult Dragonflies have been recorded in November on many occasions, for one to be seen as late as the 20th is, indeed, very unusual. No British species has ever been known to hibernate. Some examples can live for several weeks during the summer and autumn. During that time of year the adult would, of course, find plenty of food. This would not be the case later in the year. No doubt it is a combination of cold, lack of food (caused by the cold) and sheer old age that leads to the death of the late season specimens.

—D. H. R. Keen (3309)

The Pleasure of Tortoiseshells — On 20th May 1978, whilst searching for *Inachis io* imagines, having spotted one two days previously, I came across a mass of opaque eggs, on the underside of a stinging nettle (*Urtica dioica*) leaf. Rather hoping them to be the eggs of *io*, I took the leaf indoors, and discovered instead they were the eggs of *Aglais urticae* L., by using a low powered light microscope and T. G. Howarth's 'South's British Butterflies'.

Although slightly disappointed I decided to rear them through to the adult stage in order to photograph them.

I left the hatching larvae to nibble at their egg shells before transferring them to larger boxes and 26 days later they began to pupate. After a further 12 days the emerging began and by mid-afternoon I was able to free 16 of them.

The next day was exceptionally sunny, considering the rain that had prevailed for days and no less than 67 imagines emerged. Snatching at the opportunity, I quickly released them all into the garden and ran about frantically taking pictures. For several hours the garden was 'crawling' with butterflies and it wasn't till the sky had darkened quite considerably that the last few left. In the next three days all but seven hatched, although a handful died during emergence. Of the 98 I started with, 85



FIG. C. Group of Small tortoiseshell caterpillars on Stinging nettle.
(Photo by Leigh Plester).

FIGS. D, E. Adult Small tortoiseshell butterflies feeding avidly from flowers.
(Photos by Kevin Samuels).

were freed, seven never hatched, two died whilst still larvae and four I kept for my collection.

For anyone interested *urticae* can also be reared on *Urtica urens* the Small Nettle and sometimes on *Humulus lupulus*, Hop, although the resulting imagines are decidedly small.

Incidentally, I now have a fine series of black and white pictures and colour slides.—Kevin Samuels (6340J).

Leopard Moth in Cheshire — I would like to report the capture of a near perfect specimen of the Leopard moth (*Zeuzera pyrina* L.). The moth, a female, was found at 8.30 p.m. on the 13th July 1978; it was resting on grass, underneath a Sycamore tree in my local park Widnes, Cheshire.

— John R. Williams (5594)

A Note on Hymenopterous Behaviour — I should like to report a most interesting occurrence which I witnessed recently.

I was reading a book in my garden when I noticed a solitary wasp, of appearance similar to *Cerceris arenaria* (no positive identification can be given as yet, since I have no reliable text on hymenoptera) inspecting the hawthorn hedge bordering the garden. Its behaviour was interesting: it was indulged in flying along the hedge, settling and crawling about as if in search of something, then flying a few yards further and repeating the procedure. I observed it for perhaps fifteen minutes until finally it became visibly excited after crawling upon two hawthorn leaves stuck together. It examined this pair of leaves thoroughly, pushing its antennae repeatedly into every opening available. It chose one opening and began chewing away leaf material until a 4 mm long hole exposed whatever was inside the leaf "tent" to the outside. Then it proceeded to the other end of the leaf, chewed a 2–3 mm hole in that end, crawling to the centre of the leaf, and waited a few seconds. The larva inside, about 6–7 mm long with a milky-white body, light brown head, and black mouth parts (a beetle larva, I think), having seen daylight, crawled quickly out of its shelter. When its entire body was fully exposed, the wasp pounced on it, curled itself about the larva, and stung it to leave it paralysed upon the leaf in a U-shaped "having been rendered immobile" attitude. The wasp afterwards flew off, abandoning the paralysed larva (which I was able to collect later). — R. D. Cope (5661).

The Giant Wood-Wasp in Hampshire (Hym. Siricidae) — A fine specimen of the Giant Wood-Wasp (*Sirex gigas* L.) was recovered from a chemist's shop-window in Alresford on 14th August 1978. The insect, a female, had been swatted by an assistant under the impression that it was a hornet, but was otherwise undamaged. The wingspan was $2\frac{1}{4}$ inches. I have not come across this species for some years, and it would be interesting to know how plentiful it is these days. — B. R. Stallwood (1547).

Some Observations on Glaswegian Butterflies — This year I have been concentrating mostly on butterflies. I've taken Green-veined whites, Small whites, Large whites, Small tortoiseshells, Small heaths, Common blues, Small coppers, Meadow browns, and two Grayling butterflies which I netted at Dunure on the Ayrshire coast in late July (29th). I had gone for a day trip there and noticed a number of attractive butterflies, one of which I was sure was a Painted lady; but they were flying very fast and erratic over the short grassy slopes of small cliffs near the shore. I lost the

Painted lady but noticed other rather smaller butterflies which would dart about, then rest on the sides of the cliffs. I secured one and then another further along. Also present in the area were Common blues and Meadow browns, both of which I didn't collect as I was more interested in how elusive the Graylings were. One is more heavily marked with black along the forewing borders than the other, but in both specimens the spots are clearly defined on both fore and hind wings, and the underside markings are very pronounced; wing span for both butterflies is the same — 40 millimetres. — Frank McCann (6291).

Absence of the Comma Butterfly in 1978 — I would like to record the complete absence of *Polygonia c-album* L. in this part of Hampshire. Normally it is quite common in my garden at Cheriton in all three of its flight periods, but up to the time of writing (23rd September) not one has been seen. I hope that it does not indicate a decline similar to the period pre-1920. — B. R. Stallwood (1547).

Answers to the Silhouette Quiz:—Here are the answers, given from left to right and top to bottom; HAWKMOTHS: Lime Hawk, Privet Hawk, Eyed Hawk, Poplar Hawk, Elephant Hawk. THE MIXED BUNCH: Scalloped Hook-tip, Swallow-tailed, Beautiful Hook-tip, The Lappet, Peppered Moth, The Brimstone Moth.

Expeditions to South Africa and New Guinea — More and more tours are being organised with natural history and collecting interests in mind. Canterbury Travel (248 Streatfield Road, Kenton, Harrow, Middx.) are arranging a Butterfly Tour of South Africa, while S. R. Ellis (18 Upper West Street, Reigate, Surrey) is arranging one based on Wau in the highlands of New Guinea. Both will have the services of local experts. The South African tour is for 15 days in luxury hotels and appears to include much sightseeing, while the New Guinea one is for some seven weeks in more unexplored territory. Both will cost in the region of £1,000 and further details may be obtained from the respective organisers.

SO THERE !

As a representative of the insect world,
I have often wondered on what man basis his claims,
To superiority;
Everything he knows, he has had to learn,
Whereas we insects
Are born knowing
Everything we need to know.

Don Marquis

(From "The Lives & Times of Archy & Mehitabel").

FINNISH COMMA BUTTERFLY ON HOP

The commonest foodplant of the Comma butterfly (*Polygonia c-album* L.) in northern Europe seems to be currant (*Ribes* spp.). Species of this are found growing wild in the coniferous forests, as well as being cultivated in gardens and it is not difficult to discover the brightly hued caterpillars of the butterfly feeding on their leaves. Indeed I have on occasion even found the green helmet-shaped eggs decorating the pioneering early leaves of spring.



FIG. B. A Finnish Comma butterfly at rest. (Photo by Leigh Plester).

I was surprised to discover on 10.7.78 two large larvae feeding on hop (*Humulus lupulus* L.) growing round my porch. Later scrutiny of books revealed, however, both hop and nettle (*Urtica* spp.) as alternative food-plants, also in the north of Europe.

In late August it became necessary to tear down the hop in bulk owing to the depredations of aphids and I then discovered two empty pupal cases attached to the wire netting. A third imago had died within its pupal shell, in which it still resided, fully-formed but emitting a foul odour when handled.

One of the butterflies was glimpsed on August 30th and thereafter flying about the unkempt patch that under more civilised conditions would provide a garden for the house to front on to. This specimen was photographed on a windy day as it sat on a lupin leaf, Plus-X film, an Olympus OM-1, 50 mm Macro objective and power winder being used for the hand-held exposure.

Leigh Plester (2968)

BOOK REVIEWS

Butterflies On My Mind by Dulcie Gray. 177 pp. of text amply illustrated by Brian Hargreaves in colour with some black and white drawings. Crown 4to. Angus & Robertson, Brighton, 1978. Price £5.75.

Dulcie Gray is an acknowledged actress of merit and here she proves that she has considerable talent as a writer. The text is full of information on our British butterflies, gathered together from a wide range of sources, personal and literary, presented in a very readable form. Her accent is on the preservation of our butterfly fauna with the obvious need to maintain and increase suitable habitats in which they may flourish. There are some factual inaccuracies which have been repeated from other authors but otherwise there is little to fault in the content of this pleasant little book. My main criticism is of the colour illustrations of butterflies shown in their various habitats. None is very convincing, the butterflies appearing to have been carefully painted from relaxed set specimens and the background added. The result is a rather unnatural appearance with the proportions looking wrong. One includes a myopic junior lepidopterist, classed as an enemy of the butterflies. The black and white sketches are much better. Obviously the artist is at his best when illustrating insects for identification purposes as he has so ably done in some of the Collin's Field Guides — his paintings of butterflies with a background fall short of the work of Vere Temple and others.

This book will make a delightful present for anyone with a desire to learn more about our butterflies and how they can help to conserve them for posterity.

P.W.C.

Aberrations of British Butterflies by A. D. A. Russwurm, pp. 151, incl. 40 cold plates. 4to. E. W. Classey Ltd., Faringdon 1978. Price £12.50.

The British interest in aberrations continues unabated, as attenders at meetings and annual exhibitions of our Entomological Societies will already be cognisant of. It is just forty years since the late F. W. Frohawk's 'varieties' was published and a replacement for this scarce work is long overdue. However the present work is not a replacement; it is in fact complementary to Frohawk, illustrating some of the many aberrations which have been discovered over the past forty years as well as depicting a number not known to or mentioned by Frohawk in his work. In many ways Mr. Russwurm's artistry is more pleasing than that of the 'varieties' as the specimens are depicted with a pale shadow and, in the case of the underside views, a flower or other background is shown upon which the butterflies are resting in their natural positions.

Some 340 figures, all, I am pleased to say, natural size, are shown on the forty plates and Mr. Russwurm is to be congratulated on their consistently high quality. Unlike some other recent publications he has also been served well by his publisher and printers. Opposite each plate is the legend giving the name and origin of the aberration shown. Usefully, too, its present whereabouts, and the collections through which it has passed. These legends do however contain a few misprints and inconsistencies. For instance the earlier plate legends quote 'upper and underside', but in later ones these words are omitted, although it is of course obvious that the 'a' figure represents the underside. On plate 5, Fig. 6 should be 5A and on plate 38 the sex of ab. *anommatata* of *Maniola jurtina* is not given. (Possibly due to the type breaking during the actual printing).

After the introductory matter there are some fifty pages of descriptive text. This gives brief descriptions of the species and aberrations illustrated, together with many that are not shown. When it is considered that entire books, of the size of this one, have been published on the varieties of one species alone (*Lysandra coridon*, *Pieris napi*) it will be realised that only the more common and striking aberrations have been covered, as indeed was the intent of this work. There are signs that the author has not always done his homework with some of the less popular species. For instance it has not been true for 25 years that the Large white butterflies arrive from the Continent in swarms and cause much damage. Nor is it true that 'There are not many named varieties' (of the small white) since in 1953 Lempke listed 33 named varieties of this species. I also feel it would have been useful to have correlated some of the aberrations shown in this book with their detailed genetic history as given by Roy Robinson in his 1971, but unillustrated, book "Lepidoptera Genetics".

These are but minor criticisms of what is after all intended to be a work of art rather than an extended scientific treatise. In this it succeeds admirably and is a book no admirer or collector of the Lepidoptera should be without.

S.C.

Planning and the Rural Environment by Joan Davidson and Gerald Wibberley, pp. 225; 20 tables; 24 plates; 9 diagrams. Small 4to. Pergamon Press, Oxford 1977. Price £8.50 (hardback); £4.75 (paperback).

This book is No. 18 in a long series of titles about urban and regional planning, which would appear to be aimed at the professional planner and student. In a title so vague and far-reaching the authors have made a good attempt to cover the ground, and the book is obviously the product of thorough research.

The book is divided into four main parts. The first of these is concerned with the main activities found in the countryside and here the most important is agriculture. The changing styles of forestry are examined and finally the ever increasing use of the countryside for leisure purposes is discussed. Part two looks at resources and brings out well the greatest problem the countryside faces. Because the resources are so many and varied they are administered by a large number of different organisations. Since each of these sees the countryside only from a limited point of view there is often conflict or bad management resulting in damage to the ecosystem. The third part deals with problem rural areas which we are told comprise the urban fringe and the uplands. I suspect other members may also feel sad at the development of high moors by afforestation and the planting of special grass varieties in order to render these 'unproductive' areas more 'economical'. Finally, the book looks at present-day rural planning and ahead to the future. In short the outlook is bleak, with economic and social factors continuing to take precedence over preservation and conservation. However, there is slight comfort to be drawn from the knowledge that others are aware of this problem.

This highly technical book is unlikely to appeal to our readers as entomologists since there are few references to insects or other animals. However, those members who have a wider or professional interest in the countryside may find it of interest for general reading or reference purposes.

C.H.

Insects Are Animals Too, by A. Wootton, pp. 130; 15 plates; 38 figs. A5. David & Charles, Newton Abbot. Price £3.95.

This book is an introduction to insects for the non-specialist written by the well-known naturalist Anthony Wootton, Editor of 'Countryside', who may be known to entomologists as one of the few people to successfully rear the Glow-worm (*Lampyrus noctiluca* L.) from egg to beetle. (His results were published in the Entomologist's Record for 1976).

The style of the book is readable, non-technical, and packed with observations on insect habits, biology and nomenclature (do you know why an earwig is so named?). The Author's enthusiasm for insects comes over strongly, and the message is to conserve and enjoy insects. Techniques such as M.V. trapping and 'beating' for larvae are mentioned, but

Mr. Wootton is clearly not in favour of these activities. For its price, the book is well illustrated — many of the plates are by the photographer George Hyde, and the line drawings are by the Author, although in many cases the illustrations bear little relation to the text. A number of errors are apparent, for example the Screech Beetle (p. 50) is surely *Hygrobia hermanii* Fab., not *Hydrobius fuscipes*. The most serious defect in a book of this nature is the lack of direction given to naturalists who may wish to study insects further. There is no mention of any Society to join, and the further reading selection leaves much to be desired, with no mention of Museum and A.E.S. Handbooks on techniques for rearing 'other orders'.

Paul Sokoloff

Spotters' Guide to Butterflies by George E. Hyde, pp. 64; mostly coloured illustrations. Small pocket-book size. Usborne Publishing, London, 1978. Price 65p paperback, £1.50 hardback.

This little book on European butterflies comes at a time when many young naturalists are now spending their holidays on the Continent. The book can best be described as a well-illustrated, but rough guide for the absolute amateur and as such is well put together. It has tried to emulate the original I-Spy books, having a scoring system for each species. This is supposed to stimulate an awareness of butterflies rather than a desire to collect — the catch, study and then release approach being stressed in the text. The importance of recording the relevant data is also mentioned, but this could have so easily been more strongly put over by allowing space for locality as well as date to be recorded.

Nearly 100 species, though not described, are well illustrated for the price, all being drawn on or around their natural foodplant. In nearly all species, male, female and underside are illustrated. Unfortunately, for a book that may be used by holiday-makers in non-English speaking countries, the species are all named in the vernacular, no Latin names being used at all. A few pages of text cover life-cycles, plants that are attractive to butterflies and methods of breeding, all at a level designed to stimulate an interest in young children. The book continues to set its sights on the amateur by having several very simple quizzes at the back which serve to teach youngsters to use their eyes in looking at outline, underside and habits, as valuable supplementary guides to the identification of butterflies.

An unfortunate choice of illustration in the section dealing with the differences between moths and butterflies was that of the oak eggar moth, a day-flying species. Of course, one point of difference is that moths are in general only active at night! Despite these few drawbacks, at 65p for the paperback version, this little book represents good value for the interested youngster, illustrating as it does most of the British species.

I. A. Watkinson

The Pollination of Flowers by Insects, Edited by A. J. Richards, pp. X11 + 214; 23 plates. Academic Press, for Linnean Society, London 1978. Price £12.60.

Although technical in many places this book is widespread in its coverage, and so should be most useful to any Entomologist whose interests can be aroused other than by pure collecting. It has long been recognised that insects play a vital role in the pollination of crops and flowers. Professionals, however, have only comparatively recently turned their attentions to the many problems involved in the process. This book is the distillation of recent research which formed the subject of a symposium held at Newcastle last year which was organised by the Linnean Society of London and the Botanical Society of the British Isles.

The subject is a field which offers many opportunities for the discovery and observation of new facts, even for the amateur lacking the specialised and expensive equipment usually used by professionals.

The book brings together exhaustive and up-to-date reviews of the work in process in this field and there is a strong emphasis on the role that insect pollination plays in population biology and the evolution of plants. The subjects of symbioses, insect behaviour, the role played by flower colour and the pollination of introduced plant species are also dealt with. The various authors are all well known and established in this and other fields. They include Sarah A. Corbet on 'Nectar, insects and the flowers of *Echium vulgare*'; S. J. J. Woodell, 'Directionality in bumblebees in relation to environmental factors'; M. C. F. Proctor, 'Insect pollination syndromes in an evolutionary and ecosystematic context'; D. H. Valentine, 'The pollination of introduced species with special reference to the British Isles and the genus *Impatiens*'; A. J. Beattie, 'Plant-animal interactions affecting gene flow in *Vida*'; G. J. Faulkner, 'The effect of insect behaviour on hybrid seed production of Brussels Sprouts'.

Although many symposia volumes have a brief and limited life, this one we feel, on an original subject, will become a basic reference book for some years to come. It is not only stimulating but much better and more profusely illustrated than similar volumes.

B.O.C.G.

The Aurelian, Edited by Paul E. Smart. Vol. 1. No. 1. pp. 16, size A4. The Saruman Museum, Beckley, 1977. Annual Subscription £2.25.

We welcome the appearance of a new journal devoted entirely to the Lepidoptera on this side of both the Atlantic and the Channel. For some reason England, which for two or more centuries has had the highest number of Lepidopterists of any country in the world, has never had a journal devoted entirely to that subject. Like our own beginnings and that of the Entomologists Gazette this first issue is reproduced from typescript, but by modern xerography and not duplicating, with an attractive printed cream cover.

This first issue contains the first part (illustrated) of an article by the editor on Butterfly dispersal and the shifting continents; an item on the rare *Adelpha ethelda* by Chris Samson and book reviews.

Obviously taking a completely different approach to existing journals, and ranging worldwide we look forward to future issues and wish this new venture every success.

B.O.C.G.

The Life of the Bumblebee by D. V. Alford. 80 pp. 8 plates. 3 text figs. 8vo. boards. Davis-Poynter, London, 1978. Price £3.95.

This short volume on bumblebees is intended for the non-specialist reader. Dr. Alford, the author of the monograph on bumblebees (reviewed in the Bulletin vol 35 p. 41), describes the general structure of bees and then traces the life of a *Bombus* colony from its establishment in the early spring, through brood and social development, foraging, to the final decline and death of the colony. There follows a chapter on *Psithyrus* ("cuckoo" bees), parasites and scavengers, concluding with an annotated check list of the British species, a glossary and brief bibliography.

The style is easy to read and the textual matter interesting, but in places brief to the point of skimping. The quality of the plates is mediocre and the price a little high for a book of only 80 pages. Nevertheless, a good introductory read. The author also runs the Bumblebee distribution maps scheme, and has published a series of papers on identification in the Entomologists' Gazette. AES leaflet No. 25 (now out of print) is also good for identification of species.

Paul Sokoloff

DEATH AND METAMORPHOSIS

In an experiment in which cockroaches were exposed to a fatally poisonous spray (a commercial insect-killer) it was observed that the dying animals showed unmistakable signs of what may be called *moto-taxis* or orientation to death. The setting was a room crammed with furniture, empty cans and cartons, scattered books and papers and all sorts of scrap, so that it provided the animals abundantly with dark, hidden ambits; but a large L-shaped surface was kept spotless on the floor. Later, the carcasses were collected and none of these was found on the L-shaped surface or other disclosed planes.

This does not come as a surprise since it is our knowledge that animals die secretly, in burrows, fissures, in darkness, in depths, but never in the open. If this is true (which it is by and large), it implies that dying animals detect the approach of death, by virtue of some propensity quite unknown to us, and that certain physiological clues help them in their orientation to death, mortotaxis, which can be defined

as a tendency to make for a hidden place in order to die secretly. The definition has non-scientific connotations, but the examples are there and it comes as a surprise that the subject has not captured the collective and serious attention of biologists.

This is only an attempt to pose the problem in a more accessible manner so as to convince biologists that it deserves their attention. This is done here by collating certain parallel traits seen in two types of ant-lion larvae: (1) those who are in line for pupation, and (2) those who are in line for death. It must be remembered that in the life of the insect the onset of its pupal stage virtually means its *death* as a larva, and there are experts whose opinion on this situation amounts to the recognition of a larva as an independent animal, complete in itself. Accordingly, it is not inexpedient to suggest that the above two types of larvae are confronted with identical situations. At any rate their response to these two similar (or dissimilar as the case may be) situations mainly consists, alike, of two happenings:

1. They sail into the puparium;
2. They abandon their pits.

The first behaviour is admittedly natural in a larva which undergoes metamorphosis under natural conditions and so there is no need to enlarge on this point, but the same behaviour in the other type of larvae is unexpected. As for the second behaviour, it is incredible in both types; besides, this is performed in different ways. But this can be best appreciated by examining it in conjunction with related larval traits.

As a rule, as I observed, mature and recently well-fed larvae go to pupate at once as a response to strong external intervention (rough handling or consecutive destruction of their pits). It is also my experience that some shield bugs (Family *Pentatomidae*) seem to have a tendency to go to moult under similar circumstances. But starving larvae, especially if in addition they are immature, are hardly susceptible to this. It will be interesting and important to plot these personal observations against available authentic reports on hormonal influences on insect metamorphosis, for it can be shown that here the readiness of mature, satiated larvae and the reluctance of immature, starving larvae are endocrine-controlled phenomena.

Pupation, to sum up, is the result of reduced availability or non-availability of the juvenile hormone (which induces the insect to remain in the larval stage) and an increased supply of ecdysone (which initiates cells and tissues to differentiate in the direction of adult structures). The production of ecdysone is stimulated by the production of the brain hormone which is stimulated by a state of being well-fed. Indeed, this does not explain why mature, well-fed larvae resort to immediate pupation when perturbed. If this has a hormonal context, the reason for this may be that fear entails ecdysone secretion in the same way it causes adrenaline secretion in the human body, but this can be disproved.

Some of my ant-lions which went to pupate straight ahead after provocation, in this context, were of special interest to me. At length, all of them came out of their pupal balls as weak adults who did not survive for more than 30 hours; their wings were clumsy and convoluted and they had no capacity for flight. This may suggest that their pupation was immature and that it was a forced metamorphosis in each case, which did not bring to pass the usual hormonal influences, despite their otherwise mature and satiated condition. There is also another reason why their pupation must have been consequential to the provocation.

The ant-lion larva makes an evening emergence and the adult an early morning eclosion, but it is surprising to note that the onset of its pupal phase, too, is a rhythmic activity. In Kerala (India) where I studied this insect, I noticed that it fixed on a time for this purpose. It takes place late in the morning, say, between 10.30 and 11.30. None of the instigated larvae went to pupate at this time of the day; pupation was contrived as a reaction to fear. But I have a more convincing example, offered by Larva F (as it is identified in my notebook). Its pupation was unexpected, for it was immature in terms of age as well as size. This does not square with the previous observation that immature larvae cannot be tricked into adopting untimely pupation. Nevertheless, this exception to the rule emphasizes the point in question exceptionally. Larva F. was removed from its original pit, introduced to another stratum of sand, and was perpetually disturbed. As a result it went to pupate. On the fifth day it surfaced, penetrating the wall of its puparium as adults usually do, not as an adult but as an immature larva which it was. Apparently metamorphosis could not have occurred, and apparently pupation was consequential to provocation.

In all these examples pupation is suggestive of orientation to death. But the best, most reliable, evidence can be obtained by submitting the larva to uninterrupted starvation, for this entails death and also forces the larva to remain in its larval stage; thus the larva is not metamorphically stimulated to make a puparium. This was the method I used in the instance of Larva X, which accordingly succumbed to pupation; it never came out of its puparium either as a larva or as an imago. Mortotaxis was evident.

Confronted with the prospect of pupation, larval ant-lions perform what may be called a destruction display: they set about methodically destroying and burying their pits! But this cannot be fully appreciated unless we contrast it with one of the most striking features of the larva's behaviour. A larva persists in remaining in its pit and, if it is, say, watered, in the nearest vicinity possible, and it is intent on eliminating extra sand particles as well as carcasses from its pit and retaining the typical shape of the pit constantly; such assiduity can be found only in animals with strong territorial habits. I have the paradigm of a larva which, after a partial mandible amputation, refused to take food; when-

ever an ant was introduced to the pit, it was flung out of the pit straight ahead in a neat volley along with accumulated sand particles. At length the ant was so injured that it became the surest prey possible, but the larva was only interested in cleaning up its pit each time. Its attitude was explicit: it preferred a potential pit to any easy prey which certainly would have caused much damage to the pit; since, like all larvae, it could stave off hunger for weeks, it was inclined to preserve its pit for future use.

The larva's destruction display is tellingly inconsistent with the above preservation behaviour but significant in itself as an arrangement preparatory to pupation. This activity takes up much time, sometimes forty-five minutes or more, and it begins with movements deceptively similar to those the larva makes while expanding or repairing its pit, but concealed locomotion is employed as well. The latter at times is perceptible as a moving bulge on the surface which occasionally suggests a spiral course. Closer observation will divulge an intention to retain a solid cone of fine particles by eliminating small stones or other rough particles accumulated there as a result of its initially non-constructive movements. At this point it is neither display nor destruction, and its adaptive significance is disclosed at the time of eclosion. As it emerges, breaking out of its puparium and perforating the sand, the imago is in possession of highly frail, delicate wings which it has to pump up to perfection; rough particles with sharp edges are likely to harm these wings. Besides, it is possible that the texture of grains which constitute the sand-ball enwalling the silken cocoon is of importance.

Lack of food drove Larva X to a puparium, although it was metamorphically trapped, and, to recall, the larva died. An incision of its puparium disclosed the typical silken interior and a dried carcass. The structural details of the body were not discernible but it was clear that the larva had developed the rudiments of adult features to some extent before its death.

What is most striking about Larva X was that it abandoned its pit prior to pupating, but it neither destroyed its pit nor fulfilled the typically elaborate prearrangements; it just surmounted the pit, got away from it, burrowed into the sand and succumbed to pupation. This behavioural deviation and the larva's particular hormonal conditions stand up for the assumption that its irrelevant, untimely pupation must have been orientation to death, that certain physiological clues must have assisted it in its orientation, and that these clues must have been somewhat different from those available for all larvae performing a natural metamorphosis.

By introducing the method of starvation-induced pupation into the life cycles of other insects, we may be able to set a precedent for further discussions on mortotaxis.

R. Maythil

SOME DERBYSHIRE LEPIDOPTERA IN 1975

The year 1975 was a generally successful one for me, entomologically. This is not totally because of the excellent summer which we all enjoyed, but because of a number of interesting early sightings in my county of Derbyshire. Two such sightings which come to mind concern an extremely untouched and ignored area near Findern. The area consists of a damp meadow at the bottom of the embankment adjacent to the main A38 road leading to Burton-upon-Trent. Reeds and sedges are the chief vegetation, together with charlock, thistles and mosses. One Sunday in May I visited this area in search of larvae of the Drinker Moth (*Philudoria potatoria* L.), a species which I have found nearby in the past. Sure enough, I discovered two larvae, perhaps in their fourth instar, resting on sedge-stalks. Although I had only found two of the species, I had perhaps discovered a firm brood, more of which I could find by torchlight by night (with my mother's permission!). At Findern I also saw freshly hatched Green-veined white butterflies (*Pieris napi* L.), two of which I promptly acquired for my collection. I had been previously led to believe that *brassicie* and *rapae* were the only two existing whites in my area — I was proved wrong! On top of all the Green-veined whites flitting about, there were also Small tortoiseshells (*Aglais urticae* L.) which were together with Large cabbage white (*Pieris brassicae* L.). I also spotted a Small copper (*Lycaena phlaeas* L.), which added to the vast variety of other insects to be seen. The butterfly rested on a thistle, and, like all the other insects, seemed unaffected by the traffic above.

In early June I saw many Orange Tip (*Anthocharis cardamines* L.) butterflies which I had not seen previously in Derbyshire in such great numbers. These were also seen, in the main, next to main roads, usually amongst Hedge garlic. Early June was also a time for me to look for Oak eggar (*Lasiocampa quercus* L.) larvae at Hilton on the main road between Etwall and Uttoxeter, Staffordshire. Here, I found large numbers of Yellow-tail (*Euproctis similis* L.), feeding on the hawthorn surrounding the local cricket pitch. My previous visit had revealed the same species alone, whilst my first search in 1973 produced larvae of the Oak eggar which was feeding on Wild Rose, Yellow-tail on hawthorn, and Figure of eighty (*Episema caeruleocephala* L.) also on hawthorn.

In mid-June I started my crude home-made moth trap, to begin a two-and-a-half month spell of operation, which ended on August 31st. The trap attracted the following species, whose numbers are included:

NOCTUIDAE

Heart and Dart (<i>Agrotis exclamationis</i>)	...	...	...	40
Large Yellow Underwing (<i>Noctua pronuba</i>)	...	...	...	233
The Flame (<i>Axylia putris</i>)	...	...	...	8
Setaceous Hebrew Character (<i>Amathes c-nigrum</i>)	...	...	...	4
Poplar Grey (<i>Apatele megacephala</i>)	...	...	...	1
Broom Moth (<i>Ceramica psi</i>)	...	...	...	2

The Brick (<i>Agrochola circellaris</i>)	...	...	...	9
Dingy Shears (<i>Apamea ypsilon</i>)	...	...	...	3
Grey Dagger (<i>Apatele psi</i>)	...	...	...	2
Common Rustic (<i>Apamea secalis</i>)	...	...	...	3
Common Quaker (<i>Orthosia stabilis</i>)	...	...	...	4
Pale Mottled Willow (<i>Caradrina clavipalpis</i>)	...	...	...	4
Square-Spot Rustic (<i>Amathes xanthographa</i>)	...	...	...	23
Dark Arches (<i>Apamea monoglypha</i>)	...	...	...	18
Bright-Line Brown Eye (<i>Diataraxia oleracea</i>)	...	...	...	2
Common Wainscot (<i>Leucania pallens</i>)	...	...	...	1
Flounced Rustic (<i>Luperina testacea</i>)	...	...	...	33
The Campion (<i>Hadena rivularis</i>)	...	...	...	2
Smoky Wainscot (<i>Leucania impura</i>)	...	...	...	16
Dot Moth (<i>Melanchra persicariae</i>)	...	...	...	4
Turnip Moth (<i>Aerotis segetum</i>)	...	...	...	4
Lesser Yellow Underwing (<i>Euschesis comes</i>)	...	...	...	28
Red-Headed Chestnut (<i>Conistra erythrocephala</i>)	...	...	...	14
Red-Line Quaker (<i>Agrochola lota</i>)	...	...	...	1
Rosy Rustic (<i>Gortyna micacea</i>)	...	...	...	12
Common Quaker (<i>Orthosia stabilis</i>)	...	...	...	16
The Sallow (<i>Cirrhia icteritia</i>)	...	...	...	4
The Gothic (<i>Naenia typica</i>)	...	...	...	2
The Mouse (<i>Amphipyra tragopoginis</i>)	...	...	...	10
Lunar Underwing (<i>Omphaloscelis lunosa</i>)	...	...	...	1
The Satellite (<i>Eupsilia transversa</i>)	...	...	...	5
Antler Moth (<i>Cerapteryx graminis</i>)	...	...	...	1
The Dun-Bar (<i>Cosinea trapezina</i>)	...	...	...	1
Small Yellow Underwing (<i>Panemeria tenebrata</i>)	...	...	...	9
Chestnut Moth (<i>Conistra vaccinii</i>)	...	...	...	1
Purple Clay (<i>Diarsia brunnea</i>)	...	...	...	1

GEOMETRIDAE

Brimstone Moth (<i>Opisthagraptis luteolata</i>)	...	...	...	7
Grey Mountain Carpet (<i>Entephria caesiata</i>)	...	...	...	1
Common Pug (<i>Eupithecia vulgata</i>)	...	...	...	41
Silver Ground Carpet (<i>Xanthorhœ montanata</i>)	...	...	...	5
Currant Pug (<i>Eupithecia assimidata</i>)	...	...	...	7
Garden Carpet (<i>Xanthorhœ fluctuata</i>)	...	...	...	41
Rivulet (<i>Perizoma affinitata</i>)	...	...	...	1
Yellow Shell (<i>Euphyia bilineata</i>)	...	...	...	2
Riband Wave (<i>Sterrhæ aversata</i>)	...	...	...	26
Cream Wave (<i>Scopula lactata</i>)	...	...	...	2
Green Pug (<i>Chloroclystis rectangulata</i>)	...	...	...	4
The Engrailed (<i>Ectropis biundulata</i>)	...	...	...	36
Grey Pug (<i>Eupithecia castigata</i>)	...	...	...	1
Swallowtailed Moth (<i>Ourapteryx sambucaria</i>)	...	...	...	4
Foxglove Pug (<i>Eupithecia pulchellata</i>)	...	...	...	3
Dotted Border Wave (<i>Sterrhæ silvestriaria</i>)	...	...	...	2
Magpie Moth (<i>Abraxas grossulariata</i>)	...	...	...	3
Scalloped Oak (<i>Crocallis elinguaris</i>)	...	...	...	9
Early Thorn (<i>Selenia bilunaria</i>)	...	...	...	2
Lime-Speck Pug (<i>Eupithecia centaureata</i>)	...	...	...	1
Dark Marbled Carpet (<i>Dysstroma citrata</i>)	...	...	...	19
Common Marbled Carpet (<i>Dysstroma truncata</i>)	...	...	...	1
Dark-barred Twin-spot Carpet (<i>Xanthorhœ ferrugata</i>)	...	...	...	1

Small Phoenix (<i>Ecliptopera silaceata</i>)	...	...	...	2
Tawny Speckled Pug (<i>Eupithecia icterata</i>)	...	...	...	2
Small White Wave (<i>Asthenes albulata</i>)	...	...	...	2
Winter Moth (<i>Operophtera brumata</i>)	...	...	...	2
V-Moth (<i>Itame wauaria</i>)	...	...	...	1

PLUSIIDAE

Silver Y (<i>Plusia gamma</i>)	...	...	...	29
Beautiful Golden Y (<i>Plusia pulchrina</i>)	...	...	...	5
Burnished Brass (<i>Plusia chrysitis</i>)	...	...	...	10
Gold Spangle (<i>Plusia bractea</i>)	...	...	...	1

HEPIALIIDAE

Common Swift (<i>Hepialus lupulina</i>)	...	...	...	4
Ghost Moth (<i>Hepialus humuli</i>)	...	...	...	1

LASIOCAMPIDAE

Lackey Moth (<i>Malacasoma neustria</i>)	1
--	-----	-----	-----	---

THYATRIDAE

Peach-Blossom (<i>Thyatira batis</i>)	...	...	...	1
Buff Arches (<i>Habrosyne pyritoides</i>)	...	...	...	2

HYPENIDAE

The Snout (<i>Hypena proboscidalis</i>)	2
---	-----	-----	-----	---

MICRO-LEPIDOPTERA

Lesser Magpie (<i>Eurrhynx hortulata</i>)	...	...	...	6
Common Crimson and Gold (<i>Pyrausta nivalis</i>)	...	...	...	1
Garden Pebble (<i>Evergestis forficalis</i>)	...	...	...	1
Large White Plume (<i>Pterophorus pentadactyla</i>)	...	...	...	3
Beautiful China-Mark (<i>Parponyx stagnata</i>)	...	...	...	1
Grass Moth (<i>Agriphila tristellus</i>)	...	...	...	84
Grass Moth (<i>Crambus pascellus</i>)	...	...	...	2
Small Ermine (<i>Hyponometa evonymella</i>)	...	...	...	4
(<i>Ysolophus harpella</i>)	...	...	...	14
Mother-of-Pearl (<i>Pleuropteryx ruralis</i>)	...	...	...	3
Triangle Plume (<i>Platyptilia gonodactyla</i>)	...	...	...	11

The year 1975 was an excellent one for all kinds of ladybirds — and fat ones at that! There are still, as I write, a few Coccinellids in my garden. From a survey made of insects found in Mickelover this year, I have discovered an entirely new locality for the Common Field Grasshopper (*Chorthippus brunneus*), and also the Stripe-Winged Grasshopper (*Stenobothras lineatus*). The locality is, surprisingly enough, beside the Fine Fare supermarket on Uttoxeter Road, consisting of various types of grasses, and Birds-Foot Trefoil which attracts the Small Copper (*Lycaena phlaeas*) to the area. The Wall Brown (*Pararge aegeria*) takes refuge, on sunny days, on the pile of stones next to the Nags Head car park!

Another interesting suburban observation was made when I was returning to a cricket match in which my father was playing. I was returning from Derby town centre, having bought a few items, when, at the base of the wall adjoining the 'Cattle Market' public house, I spotted an almost full-grown larva of the Large Elephant Hawk (*Deilephela elpenor*) which was resting on a stalk of Rosebay-Willowherb. Having virtually given up

the hunt for this species, I could hardly have wished for anything better, especially opposite a busy bus garage! This larva was among my best observations, which were: *Necrophorus investigator* and *N. humator* attracted to moth-trap in August and two Small Phoenix moths (*Edipoptera silaceata*) were caught at the moth-trap on the evening of 14th August. Brimstone butterfly (*Gonepteryx rhamni*) — one female seen on Buddleia at approximately 5.15 p.m. on Tuesday, 26th August.

A visit to the Roaches, in Staffordshire, in late August produced large numbers of adult Vapourer moths (*Orygia antiqua*) which were seen in foggy conditions — is this why the moth is so called?

T. A. Collins (4228)

UNUSUAL CREATURES AT THE MOTH-TRAP

I have run a moth-trap (initially a battery-operated 60W strip m.v. light-trap, but since 1974 a Standard Robinson 125 watt Robinson m.v. light-trap), almost every night for the past 12 years, between 1966 and 1974 in Northwood, Middlesex, and since 1975, either in my garden near Ringwood, Hampshire, or in the grounds of the Zoology Department of Royal Holloway College, Egham, Surrey. During this time I have been amazed at the selection of insects and animals, apart from Moths, which have visited the trap.

A number of species of butterfly have occurred. These include the Red Admiral (*Vanessa atalanta* L.) (two occasions), Small Tortoiseshell (*Aglais urticae* L.), Meadow Brown (*Maniola jurtina* L.), Purple Hairstreak (*Quercusia quercus* L.) (three occasions), and the Small Skipper (*Thymelicus sylvestris* Poda). I also have records of two normally day-flying moths being taken, these being the Six-spot Burnet (*Zygaena filipendulae* L.) and the Currant Clearwing (*Synanthedon salmachus* L.).

Wasps are fairly frequent visitors to the trap in late summer, and worker bees turn up in small numbers. In both cases, the insects, if still alive, are very sluggish in the morning when the trap is emptied. Various Ichneumonid and Braconid wasps occur commonly, the most notable being *Ophion luteus* L. In late summer, flying ants also occasionally find their way into the trap, but this is by no means an annual event.

Many beetles visit the trap, notable the Stag Beetles *Lucanus cervus* L. and *Dorcus parallelipedus* L. (it can be quite a shock, when turning over an egg box, to be confronted by a male stag beetle with 5 cm long mandibles staring up at you, particularly early on a Monday morning), the burying beetles *Necrophorus humator* (Goeze) and *N. vespilloides* Herbst, the Dor Beetle *Geotrupes stercorarius* L. and the Common Cockchafer *Melolontha melolontha* L. A number of species of small water beetles, particularly of the family *Hydrophilidae*, are also frequent visitors and the Great Diving Beetle (*Dytiscus marginalis* L.) has turned up once at Egham. Ground beetles such as *Carabus violaceus* L., *Pterostichus*

madidus Fabr. and *Abax parallelopipedus* Pill. & Mitt. may often be found under the trap if it is run on one spot for a few days.

Occasionally, shieldbugs such as the hawthorn shieldbug (*Aconthosoma haemorrhoidale* L.) and the forest bug (*Pentatoma rufipes* L.) are amongst the catch. Aphids occur with fair frequency and on some nights are very common. The plant hoppers *Cixius nervosus* L. and *Issus coleopterus* Fabr. have both been recorded, but only rarely.

Most catches contain some flies (Diptera) and occasionally great numbers of minute midges occur. I also have one record of over 600 Crane-flies (Tipulidae) being taken on one night in 1976 after a rainstorm (the first heavy rain for some considerable time). Mosquitoes occur, sometimes abundantly, and these may be found through the winter even when there has been a hard frost.

Lacewings (*Neuroptera*), usually of the green type such as *Chrysopa septempunctata* Wesmael are not uncommon visitors, and occasionally the smaller brown species (e.g. *Hemerobius humulinus* L.) may be recorded. Alderflies (*Neuroptera*) and Stoneflies (*Plecoptera*) occur rarely. Caddisflies (*Trichoptera*) seem to be strongly attracted to light, and I have now taken over 40 species, some of which are quite attractive (e.g. *Phryganea grandis* L., *Limnephilus lunatus* Curtis, *Rhyacophila obliterata* McLach). Several species of Mayfly (*Ephemeroptera*) crop up from time to time and on several occasions, huge numbers of one of the small Baetid species have been noted in June.

On three separate occasions birds have been trapped. Two of these were Dunnocks (*Prunella modularis* L.), the third being a Robin (*Erithacus rubecula* L.). On all three occasions, the birds have seemed very alarmed, but were otherwise unharmed; however, their flutterings inside the trap had a very derogatory effect on the condition of the insect catch. Presumably, the birds all fell into the trap accidentally whilst trying to pick moths off the top of the inner cone in the early daylight hours.

The most unusual capture I have had was that of a Pipistrelle Bat (*Pipistrellus pipistrellus*), on 11.9.1975. The bat was dead when I emptied the trap, but judging by the havoc in the trap, it must have thrashed around in the trap for some time before its final demise.

I would be very interested to hear of any other unusual beasts which have been found in moth traps.

Michael E. N. Majerus (4027)

ITALY — LAKE COMO — JULY 1977

On the 4th of July Jeremy Bishop and I departed from Caspoggio late in the afternoon for the second week of our holiday, which was to be spent at Cadenabbia on the shores of Lake Como. The coach journey proved to be scenically pleasant as we twisted down from the Italian Alps to Sondrio and the lakeside road. We found the coach journey

around the lake hair raising by British driving standards; the driver simply sounded his horn as he went round a blind corner hoping that everyone would hear him!

The hotel Bellevue was very impressive; built in Edwardian style complete with gilt pillars and aspidistras and an air of having seen better days.

The next day we had our breakfast early, eager to investigate some of the collecting localities which my uncle, Nigel Gossling, had visited in late June a number of years before. We walked up a well marked path through Cadenabbia to the small village of Griante. We found the Speckled Wood (*Pararge aegeria* L.) flying up and down in the dappled sunlight falling on the path leading between the large villa gardens. This species was particularly interesting in this area because the population appeared to be transitional between the nominate species and the subspecies *P.a. tircis* Butler, with a variety of colour forms present. The Green-veined White (*Pieris napi* L. form *napaeae* Esper) and the Small White (*P. rapae* L.) were numerous around the villages. The former being easily distinguished from the latter by its larger size and prominent black markings. On a few occasions we saw White Admirals (*Limenitis camilla* L.) which appeared to live in the large, ornate villa gardens, where they could be seen floating and gliding around the high walls and hedges bordering the path.

After passing through the village, we came to the flowery meadow land associated with small vineyards and fruit tree orchards. The most common species appeared to be the Marbled White (*Melanargia galathea* L.), the Pale Clouded Yellow (*Colias hyale* L.), Berger's Clouded Yellow (*C. australis* Verity) and second brood Wood Whites (*Leptidea sinapis* L.) and both *napi* and *rapae* were all found in reasonable numbers in this area. The only new species to be found within this particular habitat were a few freshly emerged male Knapweed Fritillaries (*Melitaea phoebe* Schiff. *alternans* Seitz).

As we continued further into the hills above the villages and the lake-side the path came close to a dried up drainage channel choked with buddleia bushes in full flower. These attracted Silver-washed Fritillaries (*Argynnis paphia* L.), High Brown Fritillaries (*Fabriciana adippe* Schiff.), Brimstones (*Gonepteryx rhamni* L.) and the occasional White Admiral and Woodland Grayling (*Hipparchia fagi* Scopoli). Here, as I had found in the Italian Alps the week before, buddleia bushes had successfully colonised nearly every area of poor stony waste ground around the villages.

Climbing further into the hills the flora progressively changed as the soil layer covering the bed rock became thinner. The grass became predominantly yellow in appearance and the land seemed to be without any agricultural use. It seems likely that the hills had once been under cultiva-



FIG. F. View to the East from the Chapel of San Martino, 450 m above lake Como, near Cadenabbia.

FIG. G. View to the North from the Chapel of San Martino looking down onto the villages of Cadenabbia and Griante.

tion, as we saw evidence of terracing and the subsequent remains of small fields, now only covered with dry grass with encroaching scrub and woodland. The path was bordered with small copses of aspen and oak trees together with elm and bramble scrub. This habitat produced a rich area for butterflies, the High Brown Fritillary (all males) being particularly common at that time with approximately one third of the form *cleodoxa* Ochseneimer. They were striking because of their large size and rich, fulvous colouration. A few Silver-washed Fritillaries were found with the female form *valesina* Esper present. In the dry meadows we found male Heath Fritillaries (*Mellicta athalia celadussa* Fruhst.), male Knapweed Fritillaries and a few Spotted Fritillaries (*Melitaea didyma* Esper); the latter species was easily the most common to be found. The blood red males were most striking, contrasting well with the yellow grass. Here, as in all areas, the Marbled White was to be found in abundance in the meadows, displaying a particularly strong contrasting black and white pattern, which tended in our opinion towards the southern Italian and Balkan form *procida* Herbst.

In the elm and bramble scrub the Blue-spot Hairstreak (*Strymonidia spini* Schiff.) was abundant, flying together with the Pearly Heath (*Coenonympha arcania* L.); Meadow Browns and Wood Whites.

In the small aspen copses I found the Woodland Grayling (*Hipparchia fagi* Scopoli.) flying from tree to tree. One landed on a dead tree about 3–4 metres from ground level; as I took a close look at the insect, I spotted the silhouette of a worn Large Tortoiseshell (*Nymphalis polychloros* L.) close by. The Woodland Grayling and allied species are rather difficult to capture due to their habit of resting on tree trunks and being particularly quick off the mark when the collector makes a quick movement. Those found at Cadenabbia proved to be no exception!

In this region we found a very large species of hornet, which naturally was given a wide berth!

At 350 metres the path opened out into small terraced dry meadows and the scrub we found at lower altitudes, appeared to have been burnt away the season before. The remaining small elm bushes were infested with Blue-spot Hairstreak with the occasional worn Ilex Hairstreak (*Nordmannia ilicis* Esper.). Jeremy managed to get an excellent photograph of the former species. The only other Lycaenidae seen were small numbers of Small Blues (*C. minimus* Fuessly.) flying round a species of Leguminosae. Large Wall Browns (*L. maera* L.) and Wall Browns (*L. megera* L.) basked in the sun on the path as we neared the exposed Chapel of San Martino (457m), characteristically, the Swallowtails (*Papilio machaon gorganus* Fruhst.) (the spring form) flew powerfully around the spur of rock on which the chapel stood.

We rested at the chapel to observe Black Kites (*Milvus migrans* L.) gliding in the hot air thermals created by the 400 m. cliff face, and we admired the panoramic view of the lake Como below us.

The next day we retraced our steps through the village of Griante in the hopes of studying the insect life at a higher altitude. Overhanging the path at one point in the village we found a Prickly Pear cactus (*Opuntia ficus-indica* L.), on which we spotted, impaled on a thorn, a large green beetle. The culprit was probably a Red-backed Shrike (*Lancus collurio* L.), a species of bird we saw a number of times on the telegraph wires in the village, and which stores food in this way for future use.

On this occasion we took a narrow path which led up through a small fault in the cliff face. A large insect flying in the shadows of a pine tree caught our attention, which I immediately thought was a Woodland Grayling. However, on further investigation we were surprised to find a Large Tortoiseshell attracted to sap exuding from a tree trunk. Further along the path we found a Small Copper (*Lycaena phlaeas* L. form *elea* Fab.) patrolling a section of the path; however, it evaded our attempts at capture, so we marked the spot for another try on our return journey.

The path snaked steeply up between large slabs of limestone. Small streams created pools of water on the path and lush grass and marshy hollows on the level areas at the edge of the path. In sharp contrast the habitat between this area and that studied the day before was interesting, the altitude difference being only about 150–200m. Not surprisingly, we recorded a few new species within this area. The most exciting being the Water Ringlet (*Erebia pronoe* Esper.), a large fine species found in small numbers flying up and down the damp rock faces bordering the path. In the marshy hollows and cuttings made by the streams we found a few specimens of the False Ringlet (*C. oedippus* Fab.), a very local Heath species, which is probably found in larger numbers later in the season as we found only fresh emerged males. We also found in this area High Brown, Dark Green, Spotted, Niobe and Knapweed Fritillaries; Marbled Whites, Swallowtails, Pale and Bergers Clouded Yellows. On small elm bushes close by, the Blue-spot and Ilex Hairstreaks were to be found. An interesting Lycaenid flying up and down the grass slopes proved to be Amanda Blues (*Plebicula amanda* Schneider). Only males appeared to be present.

At 800m the path opened out into a small uncut meadow, edged in places by hazel bushes. This was a very rich area for butterflies, and although we were not collecting crickets and grasshoppers, they were in such abundance as to be quite noticeable. Here we found Dark Green and Niobe Fritillaries flying around in numbers. At this altitude the High Brown Fritillary was being steadily replaced by the above mentioned species, since it appeared to favour the more wooded areas below. A few worn Heath Fritillaries (*M. athalia celadussa* Fruhft.) flew amongst a colony of Nickerl's Fritillaries (*Mellicta aurelia* Nickerl.); the latter easily separated from the fulvous, bright Heath Fritillaries by much darker general colouration.

In the damper areas of the meadow Amanda Blues flew with a small colony of newly emerged Scarce Coppers (*Heodes virgaureae* L.), a very distinctive species, which is easily recognisable even at a distance. Around the Hazel bushes and the edges of the meadow, Jeremy found the Woodland Brown (*Lopinga achine* Scopoli.), a very local species, and an exciting and unexpected discovery. They were easily identified by the typical Satyrid jerky flight and the darker colouration separated this species from the Meadow Brown.

I left Jeremy to investigate this area fully, whilst I continued the climb to reach the top of the cliff face (Il Dessone 885m). I was 700m above Cadenabbia and Griante which were only seen as a collection of picturesque, terracotta tiled buildings far below me. In the other direction I could see a sheltered, gently sloping valley of grassland with small areas of bracken extending up the conical shape of Monte di Tremezzo (1700m).

I only had time to study the insect life at such a high altitude for a short time; in this area the Niobe and the Dark Green Fritillaries outnumbered every other species and all were freshly emerged males. I sighted a *Boloria* species, possibly a Mountain Fritillary, but unfortunately it eluded capture. As it was getting late in the afternoon I hastened to return to Jeremy. During my absence he had sighted a White Admiral and captured a fresh female Scarce Copper. We decided to make our way back to the hotel as quickly as possible as storm clouds could be seen building up over the lake.



FIG. H. The day is done, the evening come. Back in the hotel Chris sets yesterday's captures.

The weather proved to very humid and oppressive the next day, and we limited our collecting to the area around Cadenabbia. I attended to some Camberwell Beauty larvae collected during the previous week at Caspoggio, now in their 5th instar, which were sleeved on a small willow bush in a small area of waste ground close to the hotel. I was surprised to find an isolated Holly Blue (*Celastrina argiolus* L.) and a Small Skipper (*Thymelicus sylvestris* Poda. ssp. *syriacus* Tutt.), the latter being a bright fulvous-tawny colour and was much larger than British specimens.

In conclusion both Jeremy and I considered that the area as a whole was rich in insect life. It was interesting to find such a cross section of species characteristic of Alpine and Mediterranean regions in one area — a product no doubt of the area's geographical situation with mountains to the north and the hotter plains to the south. Perhaps the most frustrating aspect of the holiday for us was the lack of access to transport to enable us to investigate the higher mountain areas around the lake. A cable car or chair lift would have been very welcome as a 600 – 700m ascent in the humid heat was more than enough for me! The only rain we encountered during our stay fell as thunder storms generally about 4.00 p.m. in the afternoon.

On the 12th July we left Cadenabbia by coach to return to Milan airport. The journey highlighted for us how an introduced species of tree can affect local environment. The False Acacia or Locust Tree (*Robinia pseudoacacia* L.), a species native to the Eastern states of North America, had been colonised extensively between Como and Milan to such an extent that over half of the woodland areas seemed to be covered with trees and young saplings of this species.

In the week we spent at Cadenabbia we recorded 42 butterfly species, which was a surprisingly large total considering the small altitude range and area investigated. The combined total of species recorded during our two week holiday in Italy both at Caspoggio and Cadenabbia came to 69.

Christopher Orpin (5736)

A COLLECTING TRIP TO THE AMERICAN ROCKY MOUNTAINS

Although I had collected North American butterflies for some 35 years, I never had the opportunity to do so amid the rich fauna of the Rocky Mountains. When, therefore, I was invited to join an expedition to that region in July 1975, I accepted eagerly. Our leader was Patrick J. Conway, accompanied by Norman Seaborg, Daniel Oosting and myself. Pat was a veteran of several previous collecting trips to the Rockies, while for the rest of us it was our first. We assembled on the evening of Friday, July 25, and drove west all night and the next morning on Interstate Highway

80 across Illinois, Iowa and Nebraska, entering Wyoming shortly after noon Saturday, July 26. Following a brief stop in Cheyenne we reached our first collecting locality, Pole Mountain in the Medicine Bow National Forest, in mid-afternoon.

Pat declared the season late, with many early species still present and others drastically reduced in numbers. Still, the locality yielded excellent results, including my first *Parnassius*, one of my great desiderata of the trip. Species taken here included *Parnassius phoebus savii*, *Cercyonis oetus charon*, *Lycaena heteronea klotzi* (the "blue" Copper), *Phyciodes campestris camillus*, *Speyeria edwardsi* and *S. aphrodite ethne*. The 7,950 foot elevation made itself immediately apparent in its effect on my physical activity; exertion was an effort!

After only about 45 minutes here, a severe thunderstorm, accompanied by heavy lightning, moved in. This pattern of mid-afternoon storms was to be repeated each day, which meant a curtailment of collecting for their duration. The lightning made it very dangerous to remain in exposed, especially elevated, situations.

From Pole Mountain we drove through Laramie and took Route 130 west to Snowy Range Pass. This famous locality was nearly devoid of butterflies, much to our disappointment. A great deal of snow was present and the weather was still stormy, so we made no attempt to collect but drove on toward the little village of Centennial. On a forested mountain-side road with some sagebrush flats we collected for about 1½ hours in the late afternoon. Pat considered it very poor in comparison with previous years, but it yielded more species new to my experience, including *Colias alexandra*, *Coenonympha tullia ochracea*, *Oarisma garita* and *Euphydryas anicia eurytion*, as well as *Colias philodice* and *Pieris proto-dice*, which also occur in the eastern United States.

From here we went on into the village of Centennial, where we refuelled and partook of the famous Coors beer, which is indigenous to the western states. Although I am not a lover of this beverage, still I found it perceptibly lighter and milder than the usual brew. From Centennial we drove on west on Route 130 to Saratoga, where we enjoyed excellent steaks. En route again after this brief respite, we continued on Route 130 to Interstate 80 again, turning off it to Route 287 at Rawlins. At about two o'clock in the morning of Sunday, July 27, we stopped at a roadside rest area and slept in the car until daybreak. Reviving somewhat after a most uncomfortable night, we continued into Lander for fuel and breakfast. From here we took Routes 287 and 28 to Sinks Canyon Road.

Along this road we collected at several very productive localities during the day. The first was a willow bog located to the west of the road at its intersection with Slate Creek, surrounded by sagebrush-covered hills and with a profusion of flowers. With cloudless skies and a light breeze, collecting conditions were ideal. Here I took my first *Erebia epipsodea*,

the commonest North American member of the genus; it was numerous but worn. My other captures were *Plebeius glandon rustica*, *P. saepiolus*, *Lycaena cupreus snowi*, *Boloria selene* near *tollandensis*, *Speyeria mormonia eurynome*, several *Coenonympha tullia ochracea*, and a very worn male *Papilio multicaudata* (= *P. daunus*), the Two-tailed Tiger Swallowtail, the capture of which was a distinct thrill.

After about an hour we went on to the next locality, a pine-forested rocky hillside with open areas containing sagebrush and flowers. Again collecting was good, with an hour's effort yielding *Philotes enoptes ancilla*, *Lycaeides argyrognomon longinus* and *Hesperia nevada*, as well as more *Erebia epipsodea* and *Parnassius phoebus savii*.

Our next stop was Canyon Creek Bog, a large, very wet willow bog, forested on all sides. Through it flowed the sluggish creek, which became swifter as it left the bog over many large boulders. In the bog were taken a few *Boloria frigga*, and near the boulders there was a colony of the rather rare *Colias gigantea harroweri*, one of the principal objectives of our trip. While the others were concentrating on these species. I rather unwisely chose to explore the higher meadows, and thus failed to take them. My efforts produced only *Nymphalis milberti furcillata* and single specimens each of *Polites draco* and *Speyeria zerene*, as well as other species previously taken elsewhere. Again Pat considered the season late and species reduced in numbers in comparison with his last visit here several years ago.

After setting out again, we made a brief stop at a roadside meadow about three miles on. While a few species were flying, I did take my first *Plebeius icarioides lycea*. Another stop resulted in my capture of nymotypical *Oeneis chryxus*, larger and darker than the eastern subspecies *strigulosus* which I had taken in Michigan.

We continued north through Riverton via Routes 151, 789 and 120, through the impressive Wind River Canyon. At Cody we refuelled and continued on Route 120 to Route 296, the Sunlight Basin Road. Turning off on this good gravel road, we noted many attractive areas, but unfortunately it was now too late in the afternoon to collect. Some 20 miles along this road we reached a campground at the bottom of Sunlight Basin under Dead Indian Hill. Here we pitched camp and enjoyed an excellent repast and our first good night's sleep of the trip. The area was incredibly beautiful, and I could easily envision cowboys and Indians. Later I learned that it was indeed the scene of one of the most famous episodes of western American history, the pursuit of Chief Joseph and his tribe of Nez Perce Indians by the United States cavalry about a century before.

We were up early on the morning of Monday, July 28, breakfasted and packed up, and were en route by 8.30 a.m. Our road quickly became quite poor, with numerous deep ruts and very large rocks, obliging us to

proceed very slowly. At about ten o'clock we came upon a very large sedge and willow bog on the south side of the road. It proved to contain a large and previously unknown colony of *Colias gigantea harroweri*. This time I was successful in netting the species, but at the cost of becoming so deeply mired in the bog that for a time I feared I should have to summon assistance to extricate myself. Pat, too, sank chest deep in capturing a white female *harroweri*. In the meadow between the bog and the road the others reported taking the desirable *Coenonympha haydeni*, but every satyrid I caught was only the common *Cercyonis oetus charon*; this was rather disappointing. I also took a worn male *Papilio rutulus*, the Western Tiger Swallowtail, my first, as well as a few fresh *Oarisma garita*.

We continued on Route 296 until we reached Route 212 and to the top of Beartooth Pass, at an elevation of 10,700 feet. Here was a huge, rock-strewn alpine meadow amid the towering mountain peaks. *Oeneis taygete*, a very desirable species, was fresh and extremely common, as was *Euphydryas editha hutchinsi* form *montanus*, a small checkerspot. I also took a single *Pieris occidentalis*, a western species very similar to and sometimes considered a subspecies of the more eastern *P. protodice*. We collected this fine area for about two hours before the advent of the usual afternoon thunderstorm. Dan obtained a single male *Colias meadi*. This small, dark orange species closely related to and resembling *C. hecla* had been a prime objective of my trip, and I regretted not taking it myself. In a normal year it should have been at its peak at this time, but in this late season it was apparently just beginning to emerge.

We retraced our route to a campground on the southeast side of Beartooth Lake, where we prepared to spend the night. As it was still only mid-afternoon and the storm had passed over, we again took the field, collecting in the willow bogs located on the side of the lake and on the south side of the road across from the campground. A number of good species were present, including *Boloria kriemhild*, of which I secured a small series with considerable effort, as well as a few *Plebeius saepiolus* and a fine male *Lycaena cupreus snowi*. But by far the greatest thrill was my capture of a perfect, fresh male *Colias pelidne skinneri*, the only one of the trip, and a long-time favourite species of mine, which I had never expected to see in life. My excitement knew no bounds.

I became separated from the others and continued collecting long after they had made camp for the night, despite the hordes of voracious mosquitoes, which were the worst in my experience. I swung my net through clouds of them, filling the entire end of the bag. In my haste to get into the field I had neglected to apply mosquito repellent! Evidently I became overly fatigued, with results that were soon to make themselves known.

When finally I returned to camp, after some slight difficulty in locating it, we cooked, ate, pitched our tents and retired. During the night it began to rain, the temperature fell to about 40° F., and my air mattress deflated

due to a defective valve. I awoke early in the morning of Tuesday, July 29 chilled and ill, suffering from altitude sickness and probably a touch of hypothermia, brought on no doubt by fatigue and over-exertion at the 10,000 foot height. For a time I shivered uncontrollably, unable to eat or to drink the coffee the others prepared for me, but as they broke camp I rested and gradually began to recuperate.

Eventually we were en route, stopping first at a rock slide area just south of Twin Lakes on the west side of Highway 212. This was a known locality for the rare *Erebia magdalena*, a totally immaculate dark brown species and very difficult to capture because of the rocky terrain it inhabits. Unfortunately, however, we were too early for it. Considerable snow still lay on the ground; to walk through it in July was a remarkable experience. *Pyrgus centaureae loki* was present, a good catch. We did not remain long here, but proceeded a few miles on Route 212 to the state line between Wyoming and Montana.

My malaise had not entirely abated, so I remained in the car for a time while the others went into the field. When I felt up to it I followed and found that there were two distinct habitats on the east side of the highway. A typical rocky alpine meadow sloped to the east. At the bottom of this ridge, invisible from the road, was an extensive willow bog. We remained here until the approach of the usual mid-afternoon storm. In the meadow were many *Euphydryas editha hutchinsi* form *montanus* and *Oeneis taygete edwardsi*. *Pyrgus centaureae loki* was fairly numerous as well. I worked my way down to the willow bog and saw a species of *Boloria* frequenting it, but before I was able to take one I was driven from the field by the approaching storm. My companions, who had reached the bog earlier, found that the species was *B. freija*.

Pat reported seeing small sparrow-like birds, whose species was not determined, capturing *O. taygete edwardsi* on the wing, and took several specimens of that species with beak marks in the wings.

We learned that the weather forecast for the following day was unfavourable, so it was decided to move on to Montana. I was obliged to return home to Chicago the following day, because my vacation did not wholly coincide with those of the others, who were to continue on west, then return to this area a week later. We therefore proceeded north into Montana on Route 212 to Interstate Highway 90 just west of Billings, thence west on it toward Butte. Near Livingston a tyre blew out, and we had to unload most of our equipment from the car while changing it. When we reached Butte we obtained lodging, a good meal, and a most welcome night's rest in bed. The following morning of Wednesday, July 30, continued overcast and rainy. Pat had the car serviced and purchased a new tyre, then took me to the railway depot where I entrained for Chicago, arriving late the following evening after a most pleasant trip.

On the whole I was entirely pleased and satisfied with the trip. I took a total of 29 species for the first time, including all that I had hoped to

except *Colias meadi*, and many that I had not expected. There were a few disappointments: missing *Coenonympha haydeni* and some *Boloria*; but they were far outweighed by the good results. Had my collecting not been so impaired by the unexpectedly severe effects of altitude, I might have been able to secure somewhat larger series of some of the more choice species. Needless to say, I hope to return some day, at which time I shall have a much better idea of what to expect and how to cope with it.

A word of caution may not be amiss in the event that any reader may contemplate a visit to these regions. Distances are great and accommodations few other than campgrounds with minimal facilities. The steep grades of the roads call for extreme caution in driving and braking, especially on downgrades. Avoid remaining in the field, especially on ridges or other high, exposed situations, during the thunderstorms, and never camp in such locations. There is little danger from wildlife. A slip and fall, however, could easily cause fatal injury. It is best to venture into these areas in the company of one with mountain experience, and in any case, never do so alone.

I acknowledge the assistance provided by a narrative of the trip written by Patrick J. Conway in the preparation of my own journal, upon which this article is in turn based.

Roderick R. Irwin (1220)

THE WHITE-LETTER HAIRSTREAK (STRYMONIDIA W-ALBUM)

Following my note on page 27 of the AES Bulletin. Vol. 37 (February, 1978), I received a few replies which included some conflicting evidence—only to be expected with such a butterfly! However, a summary of some of the observations may be of interest.

1. It appears that the butterfly frequently fails to desert an infected elm, but will continue to lay so that the larvae find no foliage on hatching during the following spring.
2. Eggs are not infrequently laid on the sunless side of the tree.
3. There is some evidence that sapling elms are being used.
4. Several instances of butterflies wandering, even in healthy tree areas.
5. Conflicting news on degree of activity. Undoubtedly sluggish and reluctant to fly at times, but can also be quite lively, and on occasion, positively frisky. Incidentally, in 1976, the writer saw one drop dead from a bramble blossom, presumably of heat stroke, as the butterfly was relatively fresh.
6. Others confirm that various species of hairstreak share habitats which are irrelevant to one of the species needs; more especially will the Purple Hairstreak visit White-Letter Hairstreak elms, and the reverse on oaks.

I should like to thank all those who so kindly wrote to me, and if I may be allowed to mention just one by name, Mr. Graham Smith in particular. — A. Archer-Lock (5787)

MAKING YOUR OWN CANNIBAL CAGES

Certain larvae, as most Lepidopterists know, are decidedly cannibalistic by nature and are therefore most difficult to rear and house, without the use of innumerable cages. I have found it a simple matter to construct cheap miniature individual cages, made almost entirely from scrap.

Firstly, you will need to acquire a number of small empty Baked Bean cans, ensuring that they are all of the same diameter. Next, find an empty round, straight-sided jam or pickle jar that is of such a size as to be a snug fit inside the cans. This will become your former for making the clear plastic cylinders and the cage tops.

Cut the clear plastic material to approximately $8'' \times 9\frac{1}{4}''$, in other words, the circumference of the jar, plus $\frac{1}{2}''$ overlap. Then wrap this around the jar former and seal the overlap joint with either double-sided clear Sello-tape or clear Bostik, as shown in Fig. 1.

Cut a quantity of $\frac{3}{4}''$ wide, strips of thin card, cut from discarded cereal boxes or similar. Again using the jar former, wrap around and glue along the strip with small spots of Copydex adhesive, see Fig. 2. Continue adding and glueing strips of card until the ring thickness is about 3 thicknesses of card all around. Allow this to dry, then make a second larger ring, over the top of the one just made, this will now give you two rings which will fit one inside the other.

Place a 5'' square piece of muslin, nylon mesh or a section of lady's discarded nylon tights over the smaller ring, then put a few tiny spots of Copydex on the inside edge of the larger ring, and press down firmly, one over the other, with the muslin mesh sandwiched in between, see Fig. 3. Trim off surplus muslin material with either a sharp craft knife or scissors, see Fig. 4.

Paint the cans and cage top rings with oil paint to give a professional and longer lasting cage, see Fig. 5.

Cannibalistic larvae such as *A. cardamines* (Orange Tip) have been successfully reared from ova to pupa, requiring only a sprig of foodplant pushed into a small wet block of "Oasis" material as used by flower arrangers, or use small "Aspirin" bottles full of water sunk into soil or peat, but remember to plug the bottle neck with cotton wool!

Peter A. Martin (5228)

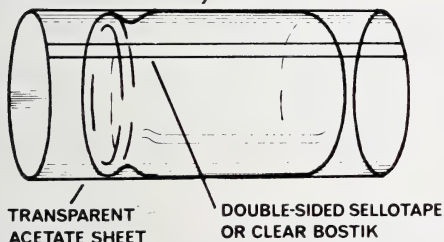


MATERIALS LIST FOR MAKING
YOUR CANNIBAL CAGES

1. SMALL EMPTY BAKED BEAN CANS.
2. TRANSPARENT ACETATE SHEET.
3. THIN CARD STRIPS FROM CEREAL CARTONS.
4. PIECES OF MUSLIN, NYLON OR LADIES TIGHTS.
5. JAM OR PICKLE JAR TO FIT INSIDE OF CAN.
6. DOUBLE-SIDED SELLOTAPE OR CLEAR BOSTIK.
7. COPYDEX ADHESIVE.
8. SCISSORS OR SHARP CRAFT KNIFE.
9. 'OASIS' FLOWER ARRANGERS MATERIAL OR SMALL ASPIRIN TYPE BOTTLES.
10. SOIL OR PEAT.

FIG.1

JAM JAR FORMER

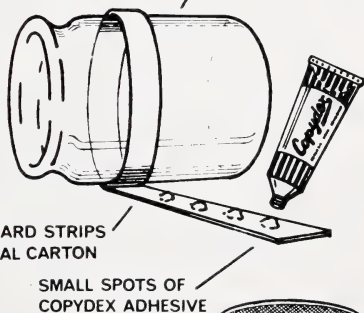


TRANSPARENT
ACETATE SHEET

DOUBLE-SIDED SELLOTAPE
OR CLEAR BOSTIK

FIG.2

JAM JAR FORMER

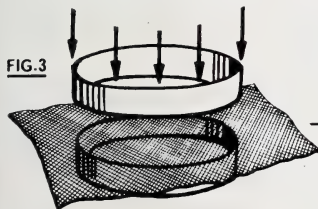


NARROW CARD STRIPS
FROM CEREAL CARTON

SMALL SPOTS OF
COPYDEX ADHESIVE

FIG.3

PUSH DOWN OVER MESH
AND SMALLER CARD RING



MUSLIN, NYLON MESH OR
PIECES OF LADIES TIGHTS

FIG.4

TRIM OFF SURPLUS MESH WITH
SCISSORS OR SHARP KNIFE

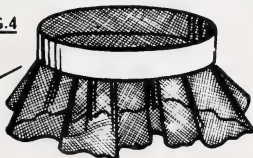


FIG.5

COMPLETED
CANNIBAL CAGE



Peter A. Martin
NATURALIST - ENTOMOLOGIST - COMMERCIAL ARTIST

SCOTCH ARGUS IN CENTRAL WEST SCOTLAND 1978

At the end of August 1977 on a visit to Central West Scotland, *Erebia aethiops* Esp. was seen in reasonable numbers on the wing, even in dull and rainy conditions.

I first came across *aethiops* on a walk in Forestry Commission land near Kilninver, south of Oban, and it was seen in good numbers as far eastwards as Dalmally where it was abundant. Just a few miles further east at Tyndrum, no specimens at all were sighted.

On holiday again in Scotland, this year, I decided to revisit the Dalmally location and observe *aethiops* more closely. Once again I found this delightful little butterfly in abundance and happily on the wing in even overcast conditions. The following brief observations made may be of interest.

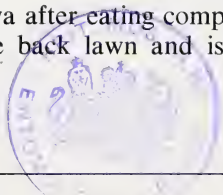
The males outnumbered females by almost ten to one. It was noticed that in their flight they flew higher and longer than the females, but never more than two or three feet above grass top height. Their excursions were obviously to search for females who were seen to generally frequent the lower and more dense part of the grassy ground cover. Here they would receive a visit from a male suddenly dropping in flight rather similar to a dead leaf falling from a tree.

On closer examination, mated females were observed to crawl busily and carefully among the grass mat close to the ground, seeking suitable sites to lay ova. These were laid singly, two or three in an area of about eighteen square inches. Then the female would take to the wing for a short distance, settling, and then rapidly crawling down low in the grass to repeat the egg-laying ritual. Invariably she chose a dead grass stem on which to lay her single ovum. Presumably this is to minimise the possibility of damage to the ovum by other grass eaters.

One egg laid on August 11th was taken for further observation and the larva hatched on August 27th, after the egg had turned a mid-grey colour five days prior to hatching. The period of sixteen days from laying to hatching, coincides with that stated in South's British Butterflies.

Incidentally, the larva after eating completely the eggshell, was given a diet of grass from the back lawn and is still happily feeding up after twelve days.

M. S. L. Simpson (4859)





Exotic Entomological Specimens

LEPIDOPTERA — COLEOPTERA — MISCELLANEOUS INSECTS

Livestock of Saturniidae, etc.

Please write for details of our lists, etc.

R. N. BAXTER

**16 BECTIVE ROAD, FOREST GATE, LONDON, E7 0DP
ENGLAND.**

For a personal and interested service

Member of the Entomological Suppliers' Association

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Othoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

Annual subscription — £6.50.

Write for specimen copy to E. H. Wild, 112 Foxearth Road, Selsdon, Croydon, Surrey, CR2 8EF enclosing 60p.

This amount will be taken into account in the first year's subscription.

THE SARUMAN MUSEUM



incorporating:
The Butterfly Sanctuary
— Saruman Butterflies
Saruman Photographic Agency
— The Butterfly Centre
Specialist in British & World
Lepidoptera & Entomologica
Equipment — Literature — Livestock
Photographs

Directors: Paul Smart F.R.E.S., Gita Smart F.R.E.S.

Consultant: John Muirhead

Technical staff: Trevor Scott F.R.E.S., Chris Samson F.R.E.S.

BECKLEY, RYE, SUSSEX TN31 6SB, ENGLAND

Telephone: BECKLEY (079 726) 279

Open to visitors daily.

Send £1.00 for our 44 page colour catalogue/book.

Supplementary lists (10 per year) a further £1.00 per annum.

Collections and Libraries purchased.

TRANSWORLD ENTOMOLOGICAL COMPANY

P.O. Box 14, Reigate, Surrey, RH2 9PW

**Lepidoptera, Phasmids, Mantids, Tarantulas, Foodplants,
Black Lights, Equipment, Heating, Exotic Insects, Deadstock.**

Typical offers:

Ready Made, beautiful Butterfly Cases, Natural wood

4 x 4 inches	Colourful large butterfly	...	£1.95
7 x 5 inches	Birdwing or tropical pair	...	£3.15
10 x 8 inches	Morpho, Atlas, Birdwings, Papilios, Silkmoths etc.	...	£5.95

Empty cases available and trade discounts up to 50%

50 all different Tropical Butterflies, including Birdwings and
25/30% Papilios, top grade, ideal for D.I.Y. Frames, £6.45.

Also at these prices, Malaysian and Philippine species including
Palinurus annae annae, Radamanthus etc.

200 World Butterflies, from South America, Mexico, Indonesia
etc. only £24.95.

This is just a selection. For full details, send large S.A.E. stating
interests. Most orders are despatched within 24 hours, letters
answered and help given. All material is first quality.

We offer a Free Mailing List, with up to 2000 World
specimens and many new and interesting species.

For our new illustrated Guide booklet "INVERTEBRATE
REARERS HANDBOOK" please send 45p in stamps and large S.A.E.

Announcing a New A. E. S. Publication

A DIPTERIST'S HANDBOOK

This long awaited handbook has now been published. Twice the size of the other handbooks in this A.E.S. series, it is a comprehensive practical guide to the collection and study of the British two-winged flies. It has been compiled by a panel of authors who are each experts in their own field. The chapters deal with collecting and study techniques, habitat and ecology, associations with the animal and vegetable kingdoms and an illustrated key to the larval stages of the Diptera. Identification of adults is left to existing literature so that maximum attention can be given to the practical needs of the field dipterist. There are details of reference books to supplement each chapter. Section appendices provide detailed information on specific diptera associations ; these have been brought together for the first time from a wide range of sources. This will be an essential book for the dipterist both at home and abroad and, because of the many associations that the flies have with the other orders, most entomologists will wish to add it to their reference works.

Available from the **A.E.S. Publications Agent**

Price £6 plus postage.

The Field Studies Council

Short courses in a wide range of subjects are arranged at nine residential centres in England and Wales, where permanent staff and visiting experts share their knowledge and enthusiasm with beginners, as well as those with specialist knowledge. All the subjects relate, in some way, to the countryside and our environment; this is just a small selection:

The Drapers' Field Centre, Rhyd-y-creuau, Betws-y-coed, Gwynedd, LL24 0HB.

Bugs, Beetles and Butterflies 25 July – 1 August

Flatford Mill Field Centre, East Bergholt, Colchester

CO7 6UL

Life in Ponds and Streams 1 – 8 August

Honey, Flowers and Insects 15 – 22 August

Juniper Hall Field Centre, Dorking Surrey RH5 6DA

Introduction to the Study of Flies ... 30 May – 6 June

Field Studies in Insect Behaviour 15 – 22 August

Introduction to the Insects of S.E. England

22 – 29 August

The Leonard Wills Field Centre, Nettlecombe Court,

Williton, Taunton, Somerset TA4 4HT.

Introducing Butterflies and Moths 15 – 17 June

Malham Tarn Field Centre, Settle, Yorkshire BD24 9PU.

Flies, Midges and Gnats 5 – 12 September

Orielton Field Centre, Pembroke, Dyfed SA71 5EZ

Animal Life in the Soil 18 – 25 July

Preston Montford Field Centre, Montford Bridge,

Shrewsbury SY4 1DX

Introducing Beetles 15 – 17 June

Butterflies and Moths 3 – 10 August

Introducing Insects 17 – 24 August

Slapton Ley Field Centre, Slapton, Kingsbridge, Devon

TQ7 2QP

All Creatures Great and Small 1 – 8 August

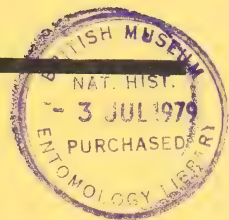
The normal price for a full week is £56.00 inclusive of accommodation, meals and tuition. For further details please write to the Warden of a Centre or, for particulars of all courses, to The Information Office, Field Studies Council (AEF), Preston Montford, Montford Bridge, Shrewsbury, SY4 1HW.

S. 56

VOL. 38 NO. 323



MAY 1979



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

WORLD LIST ABBREVIATION:
BULL AMAT ENT SOC

EDITOR:
BRIAN GARDINER FLS FRES

The Amateur Entomologists' Society

(Founded in 1935)

President :	B. R. STALLWOOD	7 Markhall Close, Cheriton, Alresford, Hants. SO24 0QF.
Hon. General Secretary :	P. A. SOKOLOFF	4, Steep Close, Orpington, Kent. BR6 6DS.
Hon. Bulletin Editor :	B. O. C. GARDINER	c/o ARC Unit, Dept. of Zoology, Downing Street, Cambridge.
Hon. General Editor :	P. W. CRIBB	355, Hounslow Road, Hanworth, Feltham, Middx.
Hon. Treasurer :	N. H. COOKE	The Pass House, Kilmahog, Near Callander, Perthshire.
Registrar	Mrs. B. W. KEEN	3 Woodbourne, Farnham, Surrey GU9 9EF.

where to write

Subscription renewals (£3.00 p.a. or £2.00 under 18) :	B. R. STALLWOOD, 7 Markhall Close, Cheriton, Alresford, Hants. SO24 0QF.
First subscriptions, (£3.50 or £2.50 under 18), changes of address, non-arrival of Bulletins, member- ship applications and records :	REGISTRAR Address in list above
Manuscripts, drawings and Books for review :	B. O. C. GARDINER, Address in list above.
Advertisers :	R. D. HILLIARD, 18 Golf Close, Stanmore, Middx. HA7 2PP. (01-954 0460)
Exhibition matters :	B. F. SKINNER, 5 Rawlins Close, South Croydon, Surrey, CR2 8JS.
General enquiries :	P. A. SOKOLOFF, Address in list above.
J.C.C.B.I. representative :	D. KEEN, 3 Woodbourne, Farnham, Surrey, GU9 9EF.
A.E.S. Conservation Group :	D. LONSDALE, Forest Res. Stn., Alice Holt Lodge, Wrecclesham, Farnham, Surrey, GU10 4LH.
A.E.S. Exotic Insects Group :	C. J. ESCHBACHER, 38 Frith Road, Bognor Regis, Sussex, PO21 5LL.
A.E.S. Insect Behaviour and Ants Study Group :	M. M. PARSONS, 95 Glebe Lane, Barming, Maidstone, Kent, ME16 9BA.

By David J. Carter
Illustrated by
Gordon Rilev

This pocket guide deals with the more common species found in the British Isles and also includes some which are more scarce but of special interest. Over 200 species are described with details of food plants, distribution and life histories. The Introduction gives a general outline of caterpillar biology and notes on collecting and conservation. 226 colour illustrations and line drawings.

£1.25 net.

Warne House Vincent Lane
Dorking Surrey RH4 3FW

Official Publications Agent

L. CHRISTIE

HAS MOVED TO


129 FRANCISCAN ROAD,
TOOTING, LONDON,
SW17 8DZ

(Postal business only)

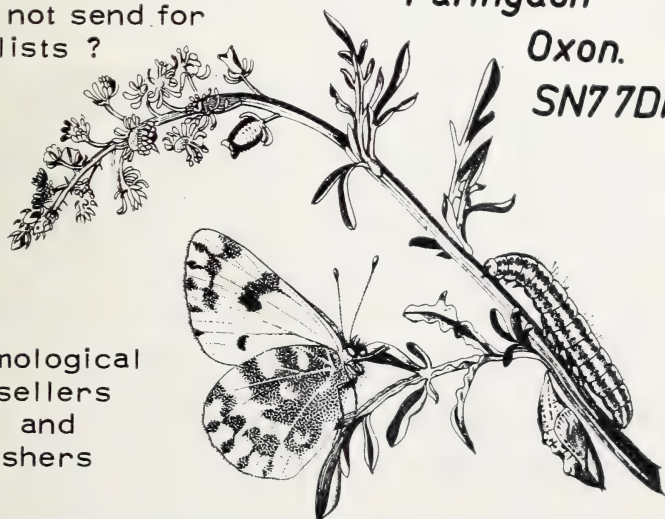
**Members of the Entomological
Suppliers Association.**

E.W.Classey Ltd.

*Park Road
Faringdon*

Why not send for
our lists ? 

Oxon.
SN77DR



Entomological Booksellers and Publishers

Member
of the
Entomological
Suppliers'
Association



Worldwide Butterflies Ltd

Open to Visitors Daily 10 - 5 incl. weekends

APRIL TO OCTOBER

**BUTTERFLIES IN A STATELY HOME FLYING AND
BREEDING IN TROPICAL PALM HOUSE
AND NATURAL JUNGLE**

Collections from across the World

FREE CAR PARKS

REFRESHMENTS

BOOKS SPECIMENS EQUIPMENT LIVESTOCK

Situated on A30 Sherborne - Yeovil dual carriageway

Send stamped addressed envelope for price list of
livestock, Entomological equipment, Specimens and Books

Worldwide Butterflies Ltd.

Compton House, Sherborne, Dorset. Yeovil (0935) 4608



THE 1979 ANNUAL EXHIBITION

This year's Annual Exhibition is to be held at Alexandra Palace on the earlier date of Saturday September 15th. Will members' please note this in their diaries and start thinking of their exhibit now please. Further details will be given in due course as usual.

POETRY

From the sweet bower, by nature form'd arise
Bright troops of virgin moths and fresh-born butterflies;
Who broke that morning from their half-year's sleep,
To fly o'er flowers where they were wont to creep,
Above the sovereign oak, a sovereign, skims
The purple emp'ror, strong in wind and limbs,
There fair Camilla takes her flight serene,
Adonis blue, and Paphia silver queen;
With every filmy fly from mead or bower,
And hungry Sphinx who threads the honey'd flower
She o'er the larkspur's bed, where sweets abound,
Views ev'ry bell, and hums th' approving sound;
Poised on her busy plumes, with feelings nice
She draws from every flower, nor tries a flow'ret twice.
George Crabbe

ANNUAL EXHIBITION, 21st OCTOBER, 1978

It was a bold decision to hire the Wembley Conference Centre. The cost appeared prohibitive, there was some doubt as to whether we would fit into the sophisticated surroundings and the only date available, was a month later than usual. A questionnaire was sent to all members and produced almost unanimous approval and most dealers promised their support. Our misgivings were completely dispelled by the success of the Meeting. Notably the comfort and space was so much better than anything we had experienced before and the tremendous support of members and friends covered our financial commitments.

One section was reserved for the dealers and in the other section, exhibits were grouped, as far as possible, in their respective Orders. A separate studio was available and two excellent films were shewn during the afternoon, 'The life of the Tiger beetle' and 'The Alder Wood-wasp'. Our usual features, the table for selling members' surplus material and

the display of A.E.S. publications were very successful and while we were not allowed to run our own refreshments, there was a convenient buffet and bar adjacent. This was the first year for the 'Ansorge bequest', the income from which provides the junior prizes. The successful juniors in order were; J. Walters, D. James and R. Eve. Details of their fine projects appear in the summary. In conclusion, Council would like to record their appreciation of the smooth running and success of the Exhibition. A new venue always raises many problems and these were fully covered by the excellent teamwork of the Organiser, Bernard Skinner, ably assisted by Peter Cribb, Colin Hart, Eric Bradford and many willing workers.

Written details were received from approximately half the exhibitors and brief details of these follow the list of other Societies present, which were: -

BRITISH BUTTERFLY CONSERVATION SOCIETY

BRITISH ENTOMOLOGICAL & NATURAL HISTORY SOCIETY

CENTRAL PANEL OF DIPTERA RECORDING SCHEME

ORGANISERS

CONCHOLOGICAL SOCIETY

MONKS WOOD EXPERIMENTAL STATION

ZOOLOGICAL SOCIETY OF LONDON

ALLEN A. A. Dr. (5788) Representatives of the sub-families of Ichneumonidae parasitising lepidoptera, with detailed notes on the various life cycles.



Our Exhibition: — Col. and Mrs. Emmet (left); Eric Bradford (centre)
Ansorge Award Winner J. Walters (right)

Examples of sexual dimorphism in Ichneumonidae. A series of *Cryphia muralis* Forst. (Marbled green moth) from Devon.

A. E. S. CONSERVATION GROUP. Under the title, 'Conservation begins with you', photographs of threatened habitats and of members at work, both on pond clearance and the maintenance of Reserves.

A geographical key to the Naturalists' Trusts.

A.E.S. EXOTIC INSECTS GROUP. Living exotic material mainly silkmoths, bred by the members of this vigorous Group.

ASHDOWN P. D. (2823) Arthropods, insects, centipedes and spiders, from special localities in Belize, British Honduras.

BAYLIS R. M. E. (5930) Bred varieties of *Arctia caja* L. (Garden tiger moth).

BEER W. J. Mr. & Mrs. (3596). All stages of the F4 generation of *Manduca atropos* L. (The Death's-head hawk moth). The original female was taken in the Canary Islands and the offspring, with mild heat, were breeding continuously in this country, on Privet.

BRETHERTON R. F. (4320) Examples of some of the Heterocera, (moths) noted on the 1978 A.E.S. Expedition and a few other Orders. (See details for P. W. Cribb).

CARTER T. (6178) British butterflies and moths including colour forms of female *Polyommatus icarus* Rott. (Common blue butterfly) and a historic *Aporia crataegi* L., (Black-veined White butterfly) from Kent, 1905.

CHALMERS-HUNT J. M. *E. diana* Hubn. bred from a cocoon off Birch in Inverness-shire. First time the early stage has been found in Britain. Specimens of *A. I-nigrum* Muller, (Black V moth) a male and female bred from a specimen taken at light at Bradwell-on-Sea, Essex.

CRIBB P. W. (2270) Examples of some of the 130 species of Rhopalocera noted on the A.E.S. Expedition to the National Parc des Ecrins, Dauphine, France and the Montagnes de Lure, Provence, 24 July to 7 August, 1978. The snow cover had not cleared from the mountains and the high altitude Erebias had not yet emerged. Lower down, species were 2/4 weeks late.

Also other Orders and a series of *Lycaena helle* Schiff., (Violet Copper butterfly) from stock taken in France last year.

CROW P. N. (393) Interesting insects from Merioneth. Aberrations of lepidoptera including a melanic *A. alni* L. Alder moth; the ichneumon fly *A. migrator* Fabr. bred from an Oak Eggar larva and, among the Syrphidae, a pair of *E. syrphoides* Fallen, new to Britain.

DYSON J. A. (5784) Varieties of *M. jurtina* L., Meadow Brown butterfly included a halved gynandromorph and series of *M. tiliae* L., Lime Hawk-moth, to show variation.

EMMET A. M., M.B.E. M.A. (1379) Immaculate type specimens of micro-lepidoptera.

1. Taken or bred subsequently from Scottish localities 19th July to 9th August, 1978.

2. 8 species new to the Essex List, 11 species new to V.C.19 (Essex) and first records for 80 years of 2 further species.

3. *E. pauperana* Duponchel from Fleam Dyke, Cambridgeshire, 14th and 17th May, 1978, 2 of several 1978 records, the first since 1931. *E. pomerana* Frey. from Wicken Fen, 30th July 1965, a species little known and undescribed in British entomological literature.

EVE R. (6063). A project on the parasites of *A.caja* L., Garden Tiger moth, with illustrations and examples. 3rd JUNIOR PRIZE.

FALK S. J. (6031). *V. zonaria* Poda. and *V. pelluscens* L., large hoverflies that develop as scavengers in wasps' nests, *M. equestris* Fab., a pest of commercial bulb growers and *S. silertis* H., a fly of peat bogs. Also Canadian Syrphids.

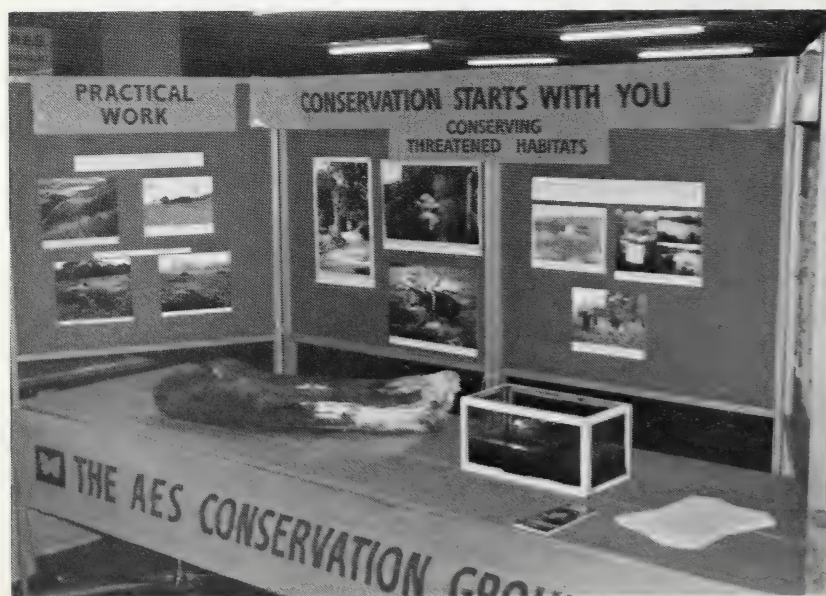
GARDINER C. J. (5249). Paintings in oils and water colours of various butterflies and beetles.

GARDINER B. O. C. (225). Rare F. W. Frohawk illustrations published by Macmillans for schools. Live examples of Tenebrionid and fruit beetles. The world's largest bloodsucking bug, *D. maximus* from Brazil.

GOODBAN B. S. (317). Bred series of *S. lunaria* Schiff., Lunar Thorn moth with totally melanic types. Melanism is common in the sub-family Ennominae but does not appear to have been recorded for this species.

HART C. (3845). Series of *L. hirtaria* Cl., Brindled Beauty moth and *B. betularia* L., Peppered moth showing the considerable variation.

HILLIARD R. D. (99). Type specimens and varieties of 34 species of



Our Exhibition:— The Conservation Group's display

moths which occur regularly in a London suburban garden during winter, late November to early March.

JAMES D. M. (5676 J). A project on the 'Hawkmoths of Worcestershire' including type specimens, distribution maps and records from the Worcester Museum and Victoria County History. **SECOND JUNIOR PRIZE.**

JAMES R. J. (5000 J). Aberrations of the Wood White butterfly, *L. sinapis* Bil. from a Worcester colony, with ecological notes.

McCORMICK T. Species of British lepidoptera seen in the second year of collecting.

MOSELEY K. A. BSc. (4733) and WILKINSON B. BSc. Ice Age Trichoptera. Photomicrographs of a subfossil Caddis fly larval apotomes from the last Ice Age. They were extracted from Peats and Silts, between 10,000 and 120,000 years old at the Birmingham Quaternary Entomology Lab.

NEWNHAM T. (4597). Detailed map of Staplefield, Handcross and the surrounding area of the Sussex Weald showing all the lepidoptera noted during one season.

PACKER L. (215). Examples of typical insect Orders from Kent.

PATEL S. J. (Mrs.) (751) and PATEL D. J. Variation in colour and wing shape of Chinese Oak Silk-moth, *A. pernyi* G.M. and series of *C. andrei* Jdn., one of the hardier exotic Silk-moths.

PHELPS H. G. (4666). Abberations taken and bred of four common British butterflies, Meadow Brown, *M. jurtina* L., Chalkhill Blue,



Our Exhibition: — Peter Cribb manning the A.E.S. stall

L. coridon Poda., Silver-washed Fritillary, *A. paphia* L. and Small Tortoiseshell, *A. urticae* L.

PICKLES A. J. (5225) and PICKLES C. T. (Mrs) Lepidoptera bred from ova and larvae including Ashworth's Rustic, *X. Ashworthii ashworthii* Doub. from North Wales, and Blossom Underwing, *O. miniosa* D. & S. from the New Forest. Larvae currently breeding including the Great Brocade, *E. occulta* L. from Scotland and the Jersey Tiger, *E. quadripunctaria* Poda. from Devon.

PLATTS J. (4300). Selection of moths bred from the Scottish Highlands and Noctuidae bred from other localities including the Feathered Ranunculus, *E. lichenea* Hubn. and the Wormwood, *C. absinthii* L.

PRATT C. R. (5965). Named and other varieties of Lepidoptera taken in Sussex including the Large Red-belted Clearwing, *A. culiciformis* L. with yellow abdominal band and Angle Shades moth, *P. meticulosa* L. with red ground colour.

REVELS R. (3942). Four panels of colour photographs. Of special interest were the life histories of Berger's Clouded Yellow Butterfly, *C. australis* Ver., Black Hairstreak, *S. pruni* Hubn., Brown Argus, *A. agestis* Schiff., White Admiral, *L. camilla* L., aberrations of the Ringlet, *A. hyperanthus* L.

Six drawers of British butterflies including results of breeding the Chalkhill Blue butterfly, *L. coridon* Poda. for 9 years, aberrations of the Ringlet, Silver-washed Fritillary and other British species.

RIVERS C. F. (1443). The natural spread of virus in the Spruce sawfly, *G. leucigniae*. The importance of birds and mammals in spreading nuclear polyhedrosis virus in the Spruce sawfly has been studied in Mid Wales. The virus spread from the Hofren Forest, the source of the Severn and the Wye rivers to the Ystwyth Forest in five years. The menace of this pest in the Welsh forests has now receded.

ST. IVO NATURAL HISTORY SOCIETY. A collection of many Orders. Also 3 special projects.

1. Detailed study of the Marbled White butterfly, *M. galathea* L. and Chequered Skipper *C. palaemon* Pal. in the Huntingdon area.

2. Distribution of the Natterjack toad in Britain.

3. Survey of the British lizards.

ST. JOHN FISHER SCHOOL BUTTERFLY CLUB, WIGAN. An exhibit showing the range of insects and other invertebrates kept in the School and their distribution on a World map. Also a formicarium and a collection of butterfly stamps.

SOKOLOFF P. (4456). Macro-lepidoptera taken or bred in 1978 including an intersex of the Light Feathered Rustic, *A. cinerae* Schiff. Micro-lepidoptera bred included the migrant *P. unionalis* Hubn. and *C. falsella*, *E. truncicolella* and *E. crataegella*, bred from moss on dry walls.

Nine species of Ladybirds beaten from conifers in Kent and the large Water beetle, *H. piceus*, taken at M.V. light.

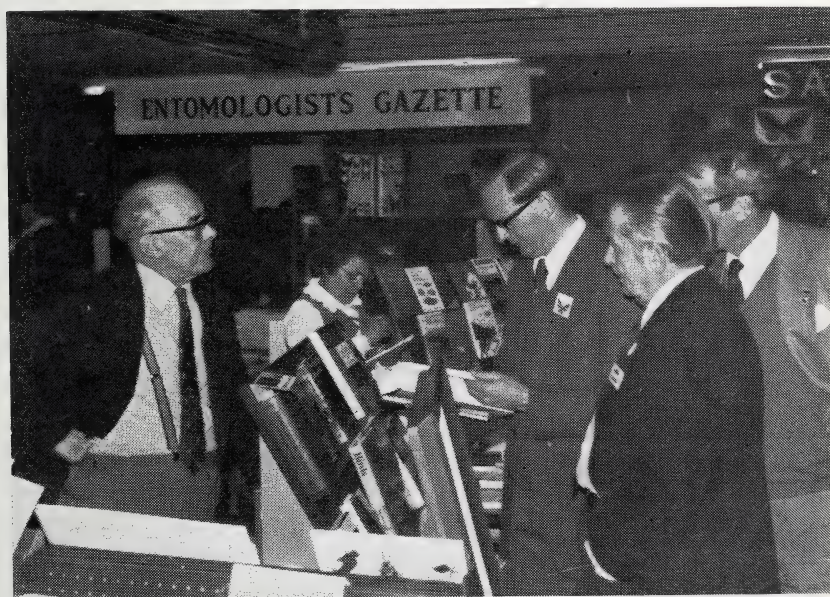
WALTERS J. (5904 J). Livestock of the Pug moth, *E. phoeniceata* Ram. from one of the new South coast colonies. Drawings and leaf mines of Nepticulidae. Life histories of various moths including Blair's Shoulder-Knot, *L. leautieri* Bois. and line drawings of the Jersey Tiger moth larva, *E. quadipunctaria* Poda. FIRST JUNIOR PRIZE. (Ansorge Award).

WATKINSON I. A. (3130). Migrant moths taken near Canterbury, Kent, 14th to 17th October, 1978 at M.V. light: Scarce Bordered Straw, *H. armigera* Hubn., Vestal, *R. sacraria* L., American Wainscot, *M. unipuncta* Haw., White Point, *M. albipuncta* Schiff. and Pearly Underwing, *P. saucia* Hubn.

Also a further specimen of Scarce Bordered Straw taken by P. J. Jewess at the same time in Aylesford, Kent.

WATSON R. & AMANDA WATSON (5691). Drawers from the National Collection of British Lepidoptera (Watson Collection) comprising a comprehensive range of forms and aberrations of three British butterflies, Scotch Argus, *E. aethiops* Esp., Silver-washed Fritillary, *A. paphia* L. and Wall, *P. megera* L. Progress of the 'red strain' of the Cinnabar moth, *T. jacobaeae* L. which has been bred continuously since 1966.

WEALDEN ENTOMOLOGY GROUP. Exhibits from: -
GOSSLING N. (5169). Butterflies in the Wealden area.



Our Exhibition:— Some well known personalities
(From left to right) Eric Classey; Mrs. Classey; Robert Goodden (Worldwide Butterflies); John Tatham (Chairman, British Butterfly Conservation Society).

PARSONS M. (5983). Lepidoptera resident in the Eastbourne area.

ADAMS A. E. C. (5060). Local species in Wadhurst.

HADLEY M. (5315). Migrant lepidoptera in Eastbourne.

YENDALL D. (3670). A comprehensive collection of insects and spiders from the Australian Continent with notes and photographs.

R. D. Hillard (99)

ANT LIONS OF NORTH EAST NIGERIA

INTRODUCTION

While at Borno Teachers' College and Toro Teachers' College in 1972, 1973 and 1974, I made a small collection of Ant Lion flies. This collection, which comprised only 18 specimens, subsequently proved to be of considerable interest as it contained 14 distinct species, none of which are pit-forming species. The fact that this collection contained such a wide range of species and that the collecting was limited almost entirely to the compounds of the Colleges concerned, gives me reason to believe that a more extensive collection from a wide variety of habitats would give rise to a much greater variety of species.

In this article I propose to give brief information about the natural history of Ant Lions followed by information about the particular species and their photographs.

Ant Lions together with Lacewings form the Sub Order Planipennia of the Order Neuroptera. The sub-order Planipennia is represented in my collection of Nigerian specimens by three families: Nemopteridae, Myrmeleonidae and Ascalaphidae.

NEMOPTERIDAE

This family is characterized by enormously elongated ribbon-like hind wings. They are striking and beautiful insects. Nothing is known about the life-history in Nigeria, but in India the cycle occupies a year and eggs are laid among dust and refuse. The larvae cover themselves with dust particles and prey on small insects. The cocoon, composed of sand and debris bound together by silk, completely encloses the pupa. This family does not include any pit-forming species.

Nemopistha imperatrix Westwood (Fig. 1)

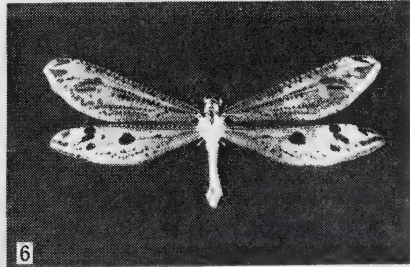
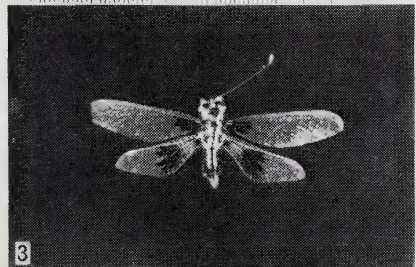
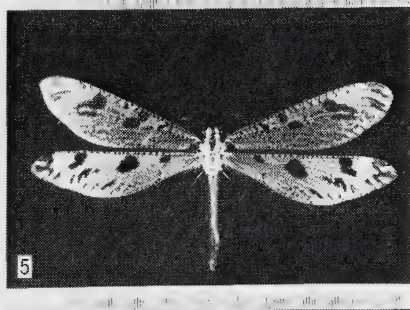
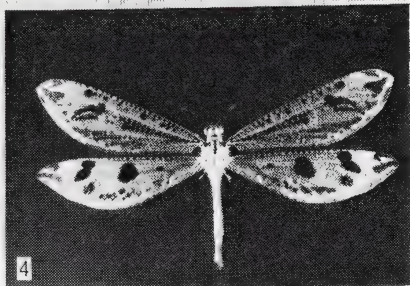
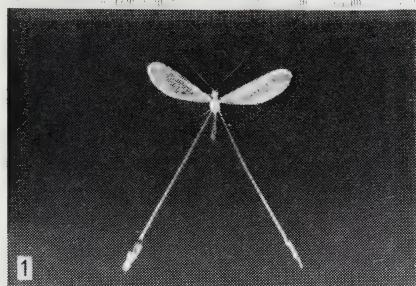
This specimen from Toro on the Jos Plateau was caught on 20th March, 1974. It is smaller than the specimens in the Natural History Museum, London, and certainly more like *N. imperatrix* than the other species recorded from Nigeria. It was the only "tailed" ant lion that I ever saw, but an acquaintance in Maiduguri did mention having seen one in the bush in 1972 and it was his first in Nigeria, although he had seen many in Asia.

ASCALAPHIDAE

This family is closely related to the Myrmeleonidae. However, unlike that family this one contains some species that are very active daytime fliers and hawk their prey like dragonflies. The ova are deposited in rows or batches on twigs and grass stems. The larvae are similar to the myrmeleons, but they are non pit-forming. They live concealed on the ground amongst stones and debris or, more rarely, on the bark of trees.

Timesibasis Waelbroeckii Van der Weele (Fig. 2)

This species has been previously recorded from Nigeria and there are half a dozen specimens in the Natural History Museum. The specimen figured here is from Toro and was caught on 24th September, 1973. It appears that there are four species in the genus, the light brown hyaline areas in the wing being replaced by almost clear hyaline areas in the other three species. In the other three species the length of the hyaline area



along the hind margin is much greater. However, there is appreciable variation amongst individuals.

Phalascusa pardalis Gersi (Fig. 3)

This specimen from Toro on the Jos Plateau was caught on 17th October, 1973. It has wing markings—the dark areas at the base of the front and rear wings, and the dark area near the centre of the rear wing—that are unique, and it cannot be confused with any other species.

MYRMELEONIDAE

This family has the general appearance of dragonflies with narrow bodies. The larval stages are known as Ant Lions. The eggs are deposited in sand. The larvae of this family hide away under stones and debris, or cover themselves with a coating of debris. However, the genus *Myrmeleon*, and several other genera, are noted for their pit-forming habit. The newly-emerged larvae excavate pits in the ground. The larva then buries itself at the bottom of the pit, leaving only its jaws protruding. An ant or other insect falling over the edge of the pit slides to the bottom of the pit where it is seized by the ant lion's strong jaws and its body juices extracted. As my collection did not include any of the pit-forming species I shall be very pleased indeed if any residents in Nigeria could send me living larvae of the pit-forming species from a variety of habitats and also any papered specimens of the imagines.

Palpares tigris Dulb

This species is very common and widespread in Africa. There are two drawers-full in the Natural History Museum. My collection included four specimens: three females (Figs. 4-6) and a male (Fig. 7), all from Toro. There is some variation in the dark markings on the wings. The longer body length of the male is characteristic. This species was also common in Maiduguri.

Palpares cataractae Pering (Fig. 8)

This is a fairly common species further south in Rhodesia and another species is found in Egypt which is very similar in colour pattern. The specimen illustrated is from Maiduguri, a female, and was caught on 19th May, 1973.

Palpares radiatus Rambur (Fig. 9)

This is considered a rare species, although the Natural History Museum has more than half a dozen specimens. Descriptions say the markings are linear in the male and more like the hind wing of *Palpares tigris* in the female. This does not apply to my specimen which is female with linear markings; however, the Natural History Museum also have a female similar to mine. This specimen is from Maiduguri, 8th July, 1973.

Cymothales mirabilis Gersr (Fig. 10)

This beautiful species is from Toro, 19th May, 1974. It is a fairly common species.

Cymothales liberiensis Van der Weele (Fig. 11)

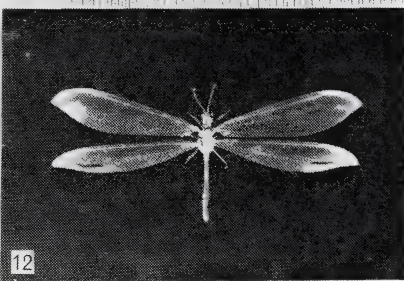
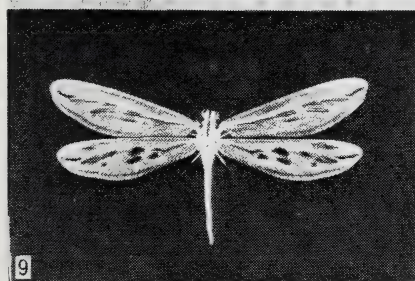
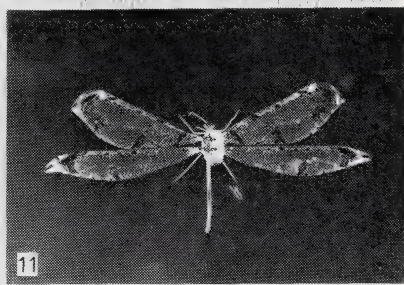
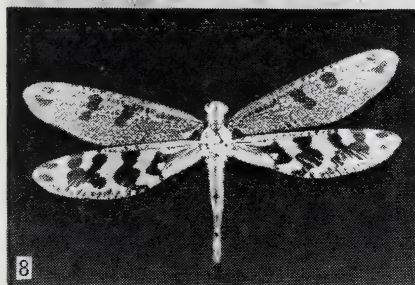
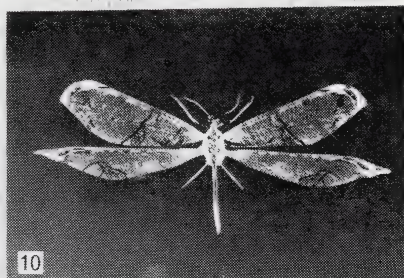
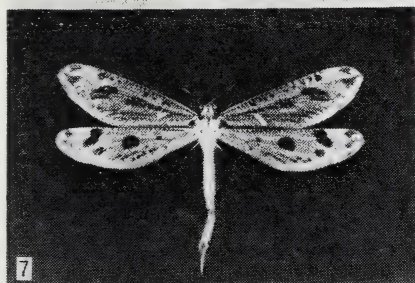
Only seven species of this genus were known prior to 1914. Now there are perhaps twice as many but several are based on colour pattern which is not always reliable criteria for classification. This specimen is from Toro, 9th May, 1974.

Formicaleo sanguinolentus Navas (Fig. 12)

This ant lion is unique in the genus in having a uniform pinkish colouring. My specimen is from Toro, 28 September, 1973. There are ten specimens in the Natural History Museum.

Formicaleo lynx Navas (Fig. 13)

Toro, 28th September, 1973. As the specific name suggests, the insect is spotted and this spotting is quite variable on the fore wings. The rear wings all show the prominent streak. The Natural History Museum has a number of specimens.



Formicaleon lituratus Navas (Fig. 14)

There has been some difficulty in identifying this specimen. Mr. P. C. Barnard of the Natural History Museum is of the opinion it is *F. lituratus*. The specimen is from Toro, 3rd October, 1973.

Creoleon africaans Rambur (Fig. 15)

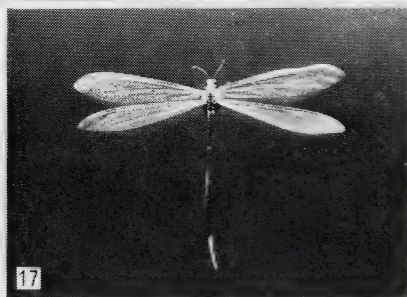
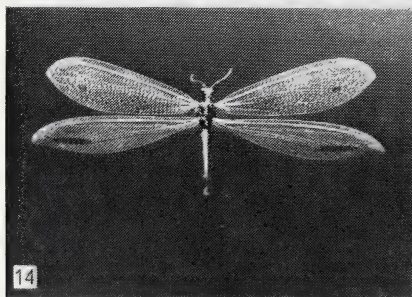
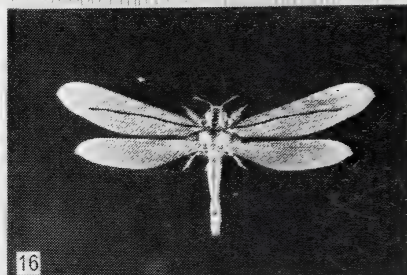
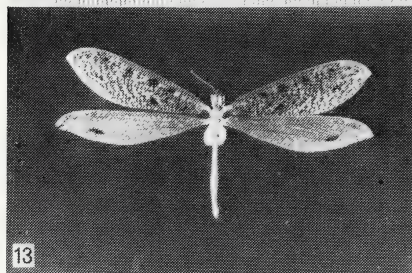
Toro, 2nd March, 1974. This is a fairly common and widespread species over much of Africa.

Centrolisis distincta Rambur (Fig. 16)

Toro, 10th October, 1973. This is a fairly common species that is distinct in having the dark streak on the fore wings and the hirsute body and legs.

Neuroleon drosimus Navas

This species is in the genus *Neuroleon* and probably *drosimus* accord-



ing to Mr. P. C. Barnard. Both specimens are from Toro, the male (Fig. 17) caught on 3rd October, 1973, and the female (Fig. 18) on 18th December, 1973.

Note: scale in millimetres.

If anyone is able to send me any specimens of live or dead material, my address is: G. A. Henwood, 18 Ganet Close, Kempshott Park, Basingstoke, Hants., U.K.

Glyn Henwood

The above article is reprinted exactly as it originally appeared in "The Nigerian Field", Vol. 42, part 3, pp. 111-117, (1977). We would like to express our thanks to The Nigerian Field Society and the editor of the Nigerian Field, Mr. L. B. Halstead, for permission to reprint.

THE ANT-LION'S PIT MAKING

The larval ant-lion, as is well known, lives in a coniform pit in which ants and other tiny creatures fall and are trapped and so captured and eaten by the larva. The pit is made in sandy soil by dint of a special movement which describes a close dextral spiral downwards; backward thrusts of the body alternate with sand-flicking movements of the mandibles in this movement. The present article delineates the post-amputation and post-regeneration pit-making behaviour of the larva, and it is based on the author's own observations.

Natural Pattern

It cannot be asserted that pit-making larvae are inclined to move clockwise invariably and unexceptionally. Newly hatched larvae, for instance, describe both dextral and sinistral curves as they scoop out their first pits. Since a mature larva is totally dextral in its motion, casually it can be concluded that it attains this sense of direction only after pursuing dextral as well as sinistral curves indiscriminately for some time. In fact, the larva's behaviour in the beginning is caused by the size of the pit it intends to, or can afford to, create. The pit is bound to be small. Consequently, its dimensions do not call for complete whorls in perfect gradation; after the completion of one or two whorls at any rate, it is impossible for the larva to scrape up rounded out rotations, clockwise or counter-clockwise. The final stage of construction is rendered possible by the sheer sand-flicking activity of the mandibles. For all that, the little pit accomplishes the right hand contour. By and by, the pit becomes bigger and bigger corresponding to the growth of the larva, and the larva's spiral movements become exclusively dextral and clockwise. However, even a mature larva may employ counter-clockwise movements, but only when it is advantageous.

Post-amputation Pattern

After limb and/or mandible amputation, the larva may quickly set

about making a pit but sometimes it does not surface until it is perked up by complete or partial regeneration. This depends on the size of the larva, the nature of the amputation; the number of organs lost, and other factors including the need for food.

First we shall allude to the pit-making behaviour of amputees during the pre-regeneration period. Limb amputation may be detrimental to the larva's survival or construction activity but it does not alter the pattern of construction behaviour; only mandible amputation can bring about the latter effect. When I amputated their left mandibles, the larvae invariably retained their typical clockwise pattern of constructive locomotion.

This result was hardly unexpected because I have always noticed in insects as well as some other animals a very interesting characteristic that may be called *bodinataxis*, orientation to boundaries (*bodina* means boundary). Anybody who has observed the activities of beetles or other insects in his room and has witnessed their locomotion along the edges of walls, then this is *bodinataxis*. Often this is punctuated by attempts to climb the wall (i.e. it is nothing but a preface to negative geotaxis) but this does not happen always. If you locate the animals somewhere else on the floor and follow its movements, more often than not you will see that it becomes *bodinatic* as the animals run into the wall. It is likely that in their perception a boundary is associated with means of escape, in the form of a hole, crevice or a grip-lending corner. In the case of the antlion larva, (because it is perhaps the only one animal with a symmetrical morphological plane and an asymmetrical dynamical plane), it was possible to assume that (with reference to its dextral nature, its lateral contact with the wall of a pit that is being excavated must be of particular tactical importance, and the role of its right mandible in this must be of high perceptual significance. If this is true, one must expect a reversed pattern in the behaviour of amputees with fatally mutilated right mandibles. When I amputated the right mandibles of a few larvae, some of them did not make pits but the rest of the amputees did this by moving in a counter-clockwise spiral.

At times, after amputation, the larvae make pits with terrace-like projections revealing the coiled frame-work which will remind you of the shell of the Atlantic sundial (*Architectonia nobilis*), but at other times they simply make small depressions. (Incidentally, the latter behaviour is also typical of larvae whose pits were consecutively destroyed). But there are other immediate reactions.

One of the immediate effects of amputation is depicted in Fig. 1 which traces the first groove-making surface operation of a larva with a broken right mandible; in all probability, it was striving after pit-construction. Having described this looped pattern on the surface, it burrowed into the sand but only to resurface and perform another groove-making patterned after the first one. Fig. 1 shows a counter-clockwise course, though actually its movements gradually brought on more and more



Fig 1

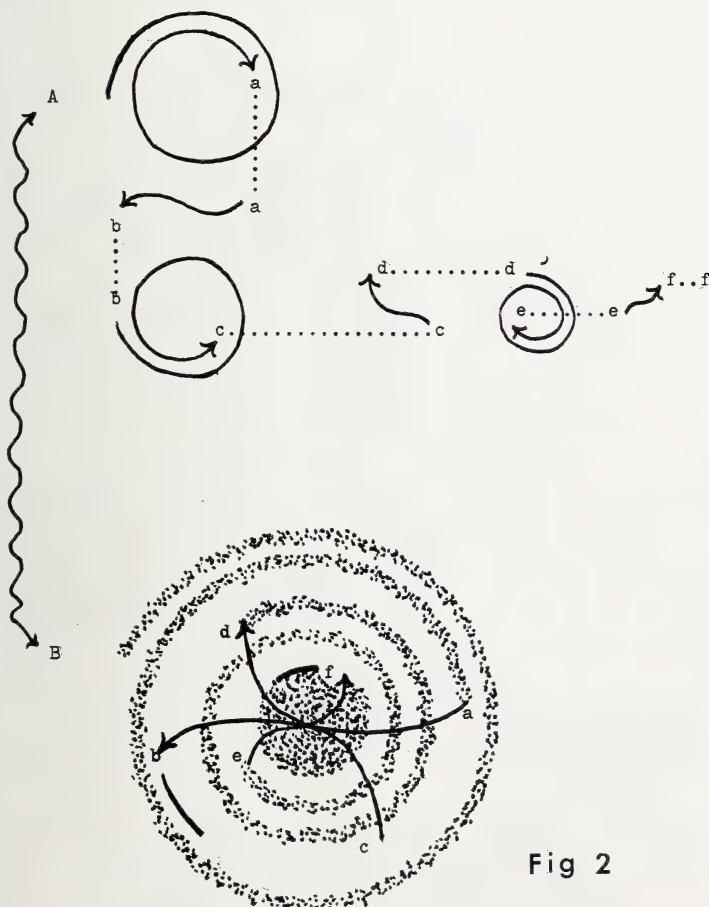


Fig 2

FIG. 1. Post-amputation movements on surface

FIG. 2. Post-regenerative pattern of pit-construction

clockwise whorls. However, whether clockwise or otherwise, it was on the order of the pattern given in Fig. 1. The groove-making movements of all amputees are on the order of the same pattern which, with all its irregularly coiled appearance, verges on a sequence: an array of distorted whorls, a wide and disjunct arc, another array, another arc, and so on. Perhaps this pattern explains why, as a regular circle does not come off, the larvae go on making those whorls one after another and why, while doing this, they hold off making a downward motion, proceeding with any of the whorls. It is not illogical to suggest that (1) the larva will not risk a downward spiral motion unless the first whorl is a geometrical circle, and that (2) it is able to recognise a perfect circle when it makes one, and also that (3) this ability cannot be totally dissociated from its bodinatactic traits.

Post-regeneration Pattern

Regeneration restores not only the amputated organ and its normal function but also the original form of that function. This is the norm. Accordingly, it can be predicted that the ant-lion larva, following the regeneration of its right mandible, would take over its pre-amputation dextral course. But often it does not do this and, more amazing, it does not even stick to its post-amputation style. What comes to pass is a compromise, a synthesis of pre- and post-amputation methods. See Fig. 2 which shows this in detail. First it chases a spiral, say, dextrally; then it does not turn around and make a sinistral revolution straight ahead, but veers from this course to take up the opposite side, bisecting the arena by an S-shaped curve, and it is now that it turns left and pieces out the sinistral spiral. This is followed by another S-shaped curve which in turn is followed by another dextral spiral, and so on. This is a return to the indiscriminate turning behaviour of the newly-hatched larva.

An exclusively dextral or sinistral method has evident advantages over the above which causes faulty construction of the pit, for, since all the S-curves do not follow the same direction, sand adjacent to the ends of each of these curves is left untouched and this results in terracing. Such terraces, with their flat areas, of course form an escape route for the prey!

Also, does an ex-amputee prefer to carry out this method throughout its larval life? The larvae I studied did it all right, but it is possible that they became fully grown and pupated before they could have recovered their pre-amputation or pre-regeneration traits.

R. Maythil (6304)

A SURVEY OF THE MACROLEPIDOPTREA OF THE WOKINGHAM AREA 1974 - 1976

Wokingham is a town situated in south east Berkshire. Entomologically it is quite interesting due to its variety of habitats over a small area. Due to many problems the whole area was not surveyed. However we chose

a representative sample of localities in the area, these are listed below which can be found on O.S. map 1.50,000 sheet no 175.

Locality A—*Limarhill woods*—Birch woodland to the west of the town. Included in the area are some unkept fields.

Locality B—*Clay Lane and surrounding area*—An area to the south east of the town (where I live). It consists mainly of farmland with lanes, hedgerows and open grassy bits here and there.

Locality C—*Honeyhill*—A wide woodland lane with some privet bushes. Trees in the area are mainly Beech and Oak with nearby pine plantations.

Locality D—*Yatley Common*—This is an area of heathland with birch scrub in nearby north Hampshire.

Locality E—*Arbourfield and Barkham area*—This area is to the west of the town—consists of well wooded land mainly deciduous consisting of Oak, Ash, Birch and Sweet Chestnut.

Locality F—*Gorrick Wood*—A Pine plantation to the south of the town. A forestry commission wood. Very little work was done here owing to our application for permission to collect being turned down.

Locality G—*City Centre at Reading*.

Locality H—*Area round Winnarsh*—A village three miles west of the town.

Locality J—*Town centre at Wokingham*—The distribution of each species will be shown by the locality letters A—J. W is used when the species in question is widespread, i.e., occurs nearly everywhere.

WOKINGHAM LEPIDOPTERA

	Distribution
<i>Satyridae</i>	
<i>Pararge aegeria</i> , L.	W
<i>Lasiommata megera</i> , L.	W
<i>Melanargia galathea</i> , L.	B
<i>Hipparchia semele</i> , L.	C,D
<i>Pyronia tithonus</i> , L.	W
<i>Maniola jurtina</i> L.	W
<i>Coenonympha pamphilus</i> , L.	W
<i>Aphantopus hyperantus</i> , L.	W (not D)
<i>Nymphalidae</i>	
<i>Vanessa atalanta</i> , L.	W
„ <i>cardui</i> , L.	W
<i>Inachis io</i> , L.	W
<i>Aglais urticae</i> , L.	W
<i>Polygonia c-album</i> , L.	W
<i>Ladoga camilla</i> , L.	A,E
<i>Lycaenidae</i>	
<i>Polyommatus icarus</i> , Rott.	W
<i>Plebejus argus</i> , L.	D
<i>Celastrina argiolus</i> , L.	W (not D)
<i>Lycaena phlaeas</i> , L.	W
<i>Callophrys rubi</i> , L.	D,F
<i>Quercusia quercus</i> , L.	A,B,E

Pieridae

<i>Pieris brassicae</i> , L.	W
„ <i>rapae</i> , L.	W
„ <i>napi</i> , L.	W
<i>Anthocharis cardamines</i> , L.	W
<i>Gonepteryx rhamni</i> , L.	W

Hesperiidae

<i>Pyrgus malvae</i> , L.	F
<i>Ochlodes venata</i> , B. and G.	W
<i>Thymelicus sylvestris</i> , Poda	W

Sphingidae

<i>Hyloicus pinastri</i> , L.	F
<i>Mimas tiliae</i> , L.	G
<i>Smerinthus ocellata</i> , L.	B
<i>Laothoe populi</i> , L.	B
<i>Deilephila elpenor</i>	A,B

Saturniidae

<i>Saturnia pavonia</i> , L.	D,F?
------------------------------	------

Notodontidae

<i>Drymonia dodonaea</i> , Schiff.	A,B,C
<i>Chaeonia ruficornis</i> , Hufn.	B,C
<i>Pheosia gnoma</i> , Fab.	A
<i>Notodonta ziczac</i> , L.	B,C
„ <i>trepida</i> , Esper	B
<i>Lophopteryx capucina</i> , L.	B,C
<i>Pterostoma palpina</i> , Clerk	A,B,C,E
<i>Phalera bucephala</i> , L.	A,G,B

Thyatiridae

<i>Habrosyne pyritoides</i> , Hun	A,B,C
<i>Thyatira batis</i> , L.	B
<i>Polyplocia ridens</i> , Fab.	A,B

Drepanidae

<i>Drepana falcataria</i> , L.	A
„ <i>binaria</i> , L.	B,C,D,E
„ <i>acertinaria</i> , L.	A,B
<i>Cilix glaucata</i> , Scop.	B

Lymantriidae

<i>Orgyia antiqua</i> , L.	W
<i>Dasychira fascelina</i> , L.	D
„ <i>pudibunda</i> , L.	A,E
<i>Euproctis similis</i> , Fues.	B,C,E
<i>Lymantria monacha</i> , L.	C,F?

Noctuidae

<i>Euxoa nigricans</i> , L.	G
<i>Agrotis segetum</i> , Schiff.	W
„ <i>clavis</i> , Hufn.	W
„ <i>puta</i> , Hübn.	W (not D or F)
„ <i>exclamationis</i> , L.	W
„ <i>ipsilon</i> , Hüfn.	W

<i>Lycophotia varia</i> , de Vill.	D,F
<i>Graphiphora augur</i> , Fab.	A,B
<i>Diarsia mendica</i> , Fab.	A,B
„ <i>rubi</i> , View.	W
<i>Ochroleura plecta</i> , L.	W
<i>Amathes baja</i> , Schiff.	B
„ <i>c-nigrum</i> , L.	W
„ <i>ditrapezium</i> , Schiff.	A,B,C
„ <i>triangulum</i> , Hufn.	A,B
„ <i>xanthographa</i> , Schiff.	W
<i>Axylia putris</i> , L.	W
<i>Euschesis janthina</i> , Schiff.	W (not D)
„ <i>comes</i> , Hübn.	W
„ <i>orbona</i> , Hufn.	B
„ <i>interjecta</i> , Hübn.	A,B,C
<i>Noctua pronuba</i> , L.	W
<i>Lampra fimbriata</i> , Sch.	B,C
<i>Cerastis rubricosa</i> , Schiff.	A,B
<i>Naenia typica</i> , L.	B,G
<i>Anarta myrtilli</i> , L.	D
<i>Mamestra brassicae</i> , L.	W
<i>Melanchra persicariae</i> , L.	A,B
<i>Diataraxia oleracea</i> , L.	A,B
<i>Discestra trifolii</i> , Hufn.	B
<i>Hadena lepida</i> , Esp.	B
<i>Orthosia gothica</i> , L.	W
„ <i>cruda</i> , Schiff.	A,B,C,E
„ <i>stabilis</i> , Schiff.	W
„ <i>incerta</i> , Hufn.	B,E
„ <i>gracilis</i> , Schiff.	W
<i>Cerapteryx graminis</i> , L.	A,B
<i>Leucania pallens</i> , L.	W
„ <i>impura</i> , Hübn.	W
„ <i>lythargyria</i> , Esp.	B,E
<i>Aporophyla nigra</i> , Haw.	B
<i>Xylocampa areola</i> , Esp.	W
<i>Eupsilia transversa</i> , Hufn.	A,B,C
<i>Dasycampa rubiginea</i> , Schiff.	B
<i>Omphaloscelis lunosa</i> , Haw.	B
<i>Agrochola lota</i> , Clerck.	B
„ <i>circellaris</i> , Hufn.	B,C
„ <i>lychnidis</i> , Schiff.	B
<i>Tiliacea aurago</i> , Schiff.	B
<i>Cirrhia icteritia</i> , Hufn.	B,E
<i>Conistra vaccinii</i> , L.	W
„ <i>ligula</i> , Esp.	A,B
<i>Apatele aceris</i> , L.	B
„ <i>megacephala</i> , Schiff.	A
„ <i>tridens</i> , Schiff.	A,C
„ <i>rumicis</i> , L.	A,B,C,E
<i>Amphipyra pyarmidea</i> , L.	B,C,E
„ <i>tragopoginis</i> , Clerck	A,B,C
<i>Rusina ferruginea</i> , Esp.	A,B
<i>Mormo maura</i> , L.	A,H,D

<i>Dypterygia scabriuscula</i> , L.	A,B,D
<i>Apamea lithoxylea</i> , Schiff.	A,B,E
„ <i>monoglypha</i> , Hufn.	W
„ <i>epomidion</i> , Haw.	A,B
„ <i>remissa</i> , Hübn.	W
„ <i>secalis</i> , Linn.	W
<i>Procus latruncula</i> , Schiff.	A,B,C,E
„ <i>vesicolor</i> , Borkh.	A,B,C,E
„ <i>fasciuncula</i> , Haw.	A,B,C,E
<i>Eremobia ochroleuca</i> , Schiff.	B
<i>Luperina testacea</i> , Schiff.	W
<i>Phlogophora meticulosa</i> , L.	W
<i>Meristis trigrammica</i> , Hufn.	B,C
<i>Caradina morpheus</i> , Hufn.	W
„ <i>alsines</i> , Brahm.	B
„ <i>blanda</i> , Schiff.	W
„ <i>clavipalpis</i> , Scop.	B
<i>Gortyna micacea</i> , Esp.	A,B
<i>Cosmia trapezina</i> , L.	W
<i>Arenostola pygmina</i> , Haw.	B
<i>Panemeria tenebrata</i> , Scop.	H
<i>Catocala nupta</i> , L.	B,E,G
<i>Euclidimera</i> <i>mi</i> , Clerck	A
<i>Ectypa glyphica</i> , L.	A,B
<i>Plusia chrysitis</i> , L.	W
„ <i>pulchrina</i> , Hübn.	A,B
„ <i>gamma</i> , L.	W
<i>Colocasia coryli</i> , L.	B,C
<i>Unca triplasia</i> , L.	W
<i>Lygephila pastinum</i> , Treit.	A
<i>Scoliopteryx libatrix</i> , L.	W
<i>Hypena proboscidalis</i> , L.	W
<i>Zanclognatha tarsipennalis</i> , Treit.	A,B
<i>Laspeyria flexula</i> , Schiff.	A
<i>Lasiocampidae</i>	
<i>Poecilocampa populi</i> , L.	J
<i>Macrothylacia rubi</i> , L.	D,F
<i>Philudoria potatoria</i> , L.	B,E
<i>Nolinae</i>	
<i>Nola cucullatella</i> , L.	B
<i>Lithosiinae</i>	
<i>Cybosia mesomella</i> , L.	B
<i>Lithosia lurideola</i> , Zinck.	W
„ <i>complana</i> , L.	W
<i>Arctiinae and Callimorphinae</i>	
<i>Spilosoma lubricipeda</i> , L.	W
„ <i>lutea</i> , Hufn.	W
<i>Cynia mendica</i> , Clerck	B
<i>Phragmatobia fuliginosa</i> , L.	B
<i>Diacrisia sannio</i> , L.	D
<i>Arctia caja</i> , L.	W
<i>Callimorpha jacobaeae</i> , L.	A,B,E

Geometridae

<i>Archiearis parthenias</i> , L.	A
<i>Aisophila aescularia</i> , Schiff	W
<i>Geometra papilionaria</i> , L.	A,B,F
<i>Comibaena pustulata</i> , Hufn.	B
<i>Hemithea aestivaria</i> , Hübn.	A,B,C
<i>Pseudoterpna pruinata</i> , Walker	D
<i>Calothysanis amata</i> , L.	W
<i>Cosymbia albipunctata</i> , Hufn.	A
„ <i>linearia</i> , Hübn.	B,C
<i>Scopula imitaria</i> , Hübn.	W
„ <i>immutata</i> , L.	B
„ <i>lactata</i> , Haw.	A,B
<i>Sterrhia seriata</i> , Schrank	A,B
„ <i>sylvestriaria</i> , Hübn	D
„ <i>aversata</i> , L.	W
„ <i>trigeminata</i> , Haw.	B
„ <i>emarginata</i> , L.	A,B
<i>Xanthorhoe montanata</i> , Schiff.	W
„ <i>fluctuata</i> , L.	W
„ <i>quadriaesiata</i> , Clark	A,B
„ <i>spadicearia</i> , Schiff.	B
„ <i>designata</i> , Hufn.	W
<i>Ortholitha mucronata</i> , Scop.	D
„ <i>plumbaria</i> , Fab.	D
„ <i>chenopodiata</i> , L.	W
<i>Larentia clavaria</i> , Haw.	J
<i>Colostygia pectoratoria</i> , Knoch	B
<i>Earophila badiata</i> , Schiff.	A,B,E
<i>Perizoma flavofasciata</i> , Thunb.	B
<i>Euphyia picata</i> , Hübn.	W
„ <i>bilineata</i> , L.	W
<i>Pelurga comitata</i> , L.	B
<i>Ecliptopera silaceata</i> , Schiff.	A,C
<i>Lygris pyraliata</i> , Schiff.	W
„ <i>mellinata</i> , Fab.	W
„ <i>testata</i> , L.	W
<i>Cidaria fulvata</i> , Forst.	B
<i>Plemyria rubiginata</i> , Schiff.	B
<i>Dysstroma truncata</i> , Hufn.	W
<i>Thera obeliscata</i> , Hübn.	B,F
<i>Hydriomena furcata</i> , Thumb.	W
„ <i>coerulata</i> , Fab.	A
<i>Rheunaptera undulata</i> , L.	A
<i>Epirrhoë alternata</i> , Müll.	W
<i>Horisme vitalbata</i> , Schiff.	B
<i>Eupithecia centaureata</i> , Schiff.	B,C
„ <i>vulgata</i> , Haw.	W
„ <i>icterata</i> , de Villers	B
„ <i>castigata</i> , Hübn.	B
„ <i>nanata</i> , Prout	D,F
„ <i>pulchellata</i> , Steph.	B,G
<i>Chloroclystis rectangulata</i> , L.	B
<i>Mysticoptera sexalata</i> , Retz	B
<i>Trichopteryx carpinata</i> , Borkh.	W

<i>Oporinia christyi</i> , Prout.	B
„ <i>dilutata</i> , Schiff.	W
<i>Operophtera brumata</i> , L.	W
„ <i>fagata</i> , Scharf.	B
<i>Abraxas grossulariata</i> , L.	W
<i>Lomaspilis marginata</i> , L.	W
<i>Bapta temerata</i> , Schiff.	W
<i>Deilinia pusaria</i> , L.	W
„ <i>exarthemata</i> , Scop.	W
<i>Ellopia fasciaria</i> , L.	F
<i>Campaea margaritata</i> , L.	A,B,C,E,G
<i>Deuteronomis alnaria</i> , L.	B,C
<i>Selenia bilunaria</i> , Esp.	B,C
„ <i>lunaria</i> , Schiff.	B
<i>Apeira syringaria</i> , L.	B,C
<i>Gonodontis bidentata</i> , Clerck	A
<i>Colotis pennaria</i> , L.	B
<i>Crocallis elinguaris</i> , L.	A,B,C,E,G
<i>Ourapteryx sambucaria</i> , L.	A,B,C,E,G
<i>Plagodis dolabraria</i> , L.	A
<i>Opisthograptis luteolata</i> , L.	W
<i>Semiothisa liturata</i> , Clerck	C,F
<i>Theria rupicapra</i> , Schiff.	A,B
<i>Erannis marginaria</i> , Fab.	W
„ <i>defoliaria</i> , Clerck	W
<i>Phigalia pilosaria</i> , Schiff.	E
<i>Lycia hirtaria</i> , Clerck	B
<i>Biston strataria</i> , Hufn.	H
„ <i>betularia</i> , L.	A,B,C
<i>Menophra abruptaria</i> , Thunb.	A,B,C
<i>Alcis repandata</i> , L.	A,B,C
<i>Pseudoboarmia punctinalis</i> , Scop.	A
<i>Ectropis biundulata</i> , de Vill	A,B,C,E,G
„ <i>epuscularia</i> , Schiff.	A,B,C,E,G
„ <i>extersaria</i> , Hübn.	A
<i>Athalura punctulata</i> , Schiff.	A
<i>Ematurga atomaria</i> , L.	D,F
<i>Bupalus piniaria</i> , L.	B,F
<i>Itame wauaria</i> , L.	W
<i>Lithina chlorosata</i> , Scop.	W
<i>Dyscia fagaria</i> , Thunb.	D
<i>Chiasmia clathrata</i> , L.	B
<i>Perconia strigillaria</i> , Hübn.	D
<i>Zygaeniidae</i>	
<i>Zygaena trifolii</i> , Es.	A,B
„ <i>lonicerae</i> , Verity	A,B
„ <i>filipendulae</i> , Trem.	A
<i>Hepialidae</i>	
<i>Hepialus humuli</i> , L.	A,B,C,E,H
„ <i>sylvina</i> , L.	A,E
„ <i>lupulinus</i> , L.	W

The following were not seen by me and their records are as follows: -

Marbled white—*Melanargia galathea* L.—Known from one specimen captured by Doug Boden (5525J).

*Grizzled Skipper—*Pyrgus malvae* L.—A few specimens were seen by Jon Foster in June 1976.

*Pine hawk *Hyloicus pinastri* L.— Also said to be found in woodland to the east and south of Crowthorne village.

*Migratory species, could of course occur anywhere.

From the records it can be seen that we have in the area 28 species of butterflies and 234 species of moths. In an area so close to the suburban sprawl of London this is good. It shows the importance of small areas of neglected land such as hedgerows, lanes, field corners and woodland, without which the insect larva would not have foodplants available.

The records shown here are correct to my knowledge with the information I have up to June 1977. However I do not claim that these records are complete. Any 'new species' that are found in the area we hope to include in the future in the form of supplements to this list.

Finally I would like to thank my colleagues Doug Boden (5525J) and Jon Foster for their invaluable help in this survey and the Forest School '100 club' for the grant for the moth trap used.

David Rees (5510J)

BOOK REVIEWS

Wild silkmoths and how to rear them by L. Arthur Myers. pp 20. 4 cold. and 4 b/w illustrations. Price 75p.

This attractive little item is by a well-known teacher and is designed as an introduction to the subject for young schoolchildren. Confining itself to the dozen easy species which can be bred by youngsters, both in and out of the classroom it succeeds admirably in its objective. The text is divided into half a dozen chapters. There is an interesting historical introduction followed by brief but adequate notes on rearing and treatment of emerging moths. Next a brief summary of the species recommended for beginners with their foodplants. Finally some general information including suppliers and we were pleased to note the AES mentioned. The four colour illustrations are particularly well produced. This booklet is available from Mr. L. Christie the AES publication agent.

B.O.C.G.

Life on Forty Acres by Barry P. Moore. pp. xii: 184; numerous illustrations. 8vo. E. W. Classey Ltd., Oxon. 1978. Price, boards, £5.50.

Occasionally a reviewer receives a book with a certain sinking feeling, and this volume sub-titled 'a saga of Australian rural life' was no exception. Happily, however, this account of an expatriate English

naturalist setting up a small-holding in Australia proved more entertaining than the title suggested. Interspersed with many of his own drawings, Dr. Moore details the setting up of his 'dream' homestead (christened by him 'Calosoma' after a genus of Ground Beetle!) against a backdrop of drought, fire, flood and even snow. The bulk of the book is devoted to a narrative description of the flora and fauna of the 'forty acres', including birds, mammals, reptiles and of course the insects. The style reflects a very personal view of the Australian bush and its inhabitants, which appear to include *Pieris rapae*, known to the locals as the Cabbage White!

Paul Sokoloff

NOTES AND OBSERVATIONS

A late speckled wood—On Wednesday 8th November last, a sunny warm afternoon, I sighted a female *Pararge aegeria* L. flying in a lane at Cockington, near Torquay, Devon. I think this to be a late date for this species. — M. S. L. Simpson (4859)

A most unusual pairing — I was attending the needs of my livestock in my emerging and breeding cage. In the cage I had pupae and cocoons of Eyed Hawk and Indian Moon moths in the process of emerging. At that time I had three female Indian Moon moths, in a row, and all were calling; naturally as luck would have it, no males had yet emerged. However there were a couple of male Eyed Hawk moths in the cage as well. The Moon moths continued calling even though I had the light on; I went to the other side of the room to look at some of my other livestock and two minutes later when I glanced at the breeding cage I was astonished to see that one of the Eyed Hawks was coupled with the middle Moon moth. She did not seem too perturbed at this although giving an occasional twitch of the abdomen. I observed them coupled for about 35 minutes and then had to leave them so unfortunately I do not know how long they remained coupled! — L. Richmond (6405)

Lepidoptera near Salisbury in 1978 — During 1978, I operated my M.V. light at the village of Whaddon or the nearby village of Landford approximately once a week. In all, including those noted at sugar and ivy, 291 species of moths were recorded. If the numbers of day fliers also seen is added on, the total becomes exactly 300. Among the many species, two especially worthy of recording were Blair's Shoulder-knot, *Lithophane leautieri* Boisduval seen on 26th September, 13th October and 26th October (seven specimens in all) and The Gem, *Orthonama obstipata* Fab. recorded on 26th October. — A. Gange (5700)

Revenge is tasty—if not sweet—Whilst trying to breed the Praying Mantis (*Mantis religiosa* L.) I introduced a male with a female in the hope of producing a pairing. After two days success was achieved, with the male firmly anchored on the back of the female. However, two brave

grasshoppers, oblivious to their cowardly colleagues (who would jump out of their chitin at the mention of a Mantid!) mounted themselves on the male's abdomen and in a few minutes reduced it to a pulp. The male died a few hours later from injuries to his abdomen, and possibly to his pride. — Charles Aquilina (5732J)

More on the Nantmor Geometers — As a follow up to Heather Perham's note in the August 1978 bulletin about geometer larvae in the Nantmor Valley, I would like to report that I too visited the area on June 13th 1978. Virtually every tree had been defoliated and the area of defoliation extended to much of the nearby Glaslyn Valley. Trees that had been attacked were:- Oak, Sallow, Birch, Ash (including even the Mountain Ash), Hawthorne and Hazel. On close inspection, few larvae were found, the majority presumably having pupated, as those which were collected pupated very soon afterwards. A wide range of colours was displayed by the larvae found. When the moths emerged late last Autumn my suspicions were confirmed that the larvae were of the Mottled umber, *Erannis defoliaria* Clerck. — Alan Gange (5700)

FURTHER ACULEATE HYMENOPTERA FROM SUSSEX

Since my previous report from Sussex (AES. Bulletin Vol 35, Feb. 1976) my records have expanded considerably; these are some of my more interesting records and observations since then.

CHRYSIDAE: *Hedychiridum integrum* (Dahlbohm) 1, Pagham, dunes. 26.vi.76.

H. ardens (Latreille in Coquebert) 1, Rogate. 5.vii.75; 1, Amberley Wild Brooks. 6.vii.75.

Omalus puncticolis (Moscary) 1, Midhurst, Runner Beans. 31.vi.77.

Chrysis viridula L. 2, Heyshott, Hoe Copse. 13.vi.76; 2, 1.viii.77; 1, Plaistow, Kingspark Wood. 3.vii.77; 1, 23.vii.77. At Hoe Copse the host, *Odynerus spinipes*, was commoner than its cleptoparasite in 1976, but at both localities in 1977 the cleptoparasite was much commoner than its host. At Hoe Copse I saw only one *Odynerus* but upwards of twenty *Chrysis viridula*.

SAPYGIDAE: *Sapyga quinquepunctata* (F.) 1♀, Midhurst, on wall. 27.v.77; 1♀, Arundel Park, on wall. 5.vi.77; 1♂, Amberley Wild Brooks, old tree roots. 5.vi.77.

SCOLICIDAE: *Tiphia minuta* Van der Linden 1♀, 1♂, Midhurst, Ambersham Common, Ground elder. 5.vi.76. This was the second week of the good 1976 summer; it was warm but had become overcast by 11.30 hrs. My attention was taken by what appeared to be small winged ants but which closer inspection revealed to be the above species. Specimens of both sexes were frequent on the flower heads of Ground elder, (*Aegopodium podagraria*) over a stretch of two hundred and fifty metres of grassland and verge.

MUTILLIDAE: *Mutilla europaea* (L.) 1 ♀, Rake, Weavers Down, on sand. 27.v.75; 1 ♂, 6.viii.75.

Smicromyrme rufipes (F.) 1 ♂, Ambersham Common 6.vii.74; 1 ♀, 27.viii.74. 1 ♀, South Ambersham, 18.vii.74.

POMPILIDAE: *Agenoides cinctellus* (Spinola) 1 ♀, Ambersham Common, sandy bank. 6.vii.74; 1 ♂, 27.viii.74; 1 ♂, 2.vii.77; 1 ♀, Plais-tow, Kingspark Wood, in tile facing of house, with prey spider; 1 ♀, Midhurst Common, roots of overturned tree, 1 ♀, Midhurst, on wall. 28.vii.77; 1 ♂, Hoe Copse. 1.viii.77.

VESPOIDAE: *Eumenes coarctata* (L.). This species has become common after two good summers. I have further records for Ambersham Common, a sighting on Midhurst Common, vii.77 and 1 , Harting Coombe. 18.vii.76.

Microdynerus exilis (Herrich-Schaffer) 1 ♀, 2 ♂♂, Amberly Wild Brooks. 6.vii.75.

SPHECOIDEA: *Astata boops* (Schrank) 1 ♀, Midhurst, Iping Common 24.viii.74; 1 ♀, Ambersham Common vii.74.

A. pinguis (Dahlbohm) 1 ♀, Pagham dunes. 3.vii.75.

Podalonia affinis Kirby 1 ♀, Emsworth, Pilsey Island. 27.viii.75

Psenulus schenki (Tournier) 1 ♀, Midhurst 4.vii.77.

Oxybelus mandibularis Dahlbohm 1 ♀, Pagham dunes 29.vii.75; 1 ♀, 15.viii.75; 2 ♂♂, Ambersham Common 4.vii.76; 1 ♂, Midhurst, Laving-ton Common. 26.vii.75.

Crabro peltarius (von Schreber) 1 ♀, Rogate. 5.vii.75; 1 ♂, Amber-sham Common. 28.vii.74; 1 ♀, Amberley Wild Brooks. 5.vi.76.

C. scutellatus (von Scheven) 2 ♀♀, Amberley Wild Brooks. 6.vii.75.

Crossocerus exiguus (Van der Linden) 3 ♀♀, 1 ♂, Rewell Wood 21.vi.75. The identification of the female is difficult, being separated from the common *wesmaeli* (Van der Linden) by small comparative characters; the male is very distinct, with a tooth on the underside of the seventh antennal segment. I took no definite specimens of *wesmaeli* on this day and my four specimens were flying over a small area of sand together. These females are the first recorded British specimens.

Ectemnius ruficornis (Zetterstedt) 1 ♀, Ambersham Common 30.vii.75.

E. borealis (Zetterstedt) 1 ♂, Ambersham Common 30.vii.75; 1 ♀, 4.vii.76; 1 ♂, Rogate, Harting Coombe 18.vii.76. These records are the first recorded outside Hampshire for this wasp, which was only added to the British list in 1972 (G. R. Else, *Ent. Gazette* vol. 25).

E. rubicola (Dufour and Perris) 1 ♂, Cammelsdale. 29.vii.76.

APOIDAE: *Hylaeus pectoralis*. I have searched many suitable areas for this bee which utilises as a nest the vacated gall caused by the fly *Lipara leucens* in the Common Reed, *Phragmites communis*. I found numbers of galls, almost all the old ones containing cells of this bee, in January 1976 at Church Norton, Pagham Local Nature Reserve. These produced a total of 12 ♀♀, 18 ♂♂.

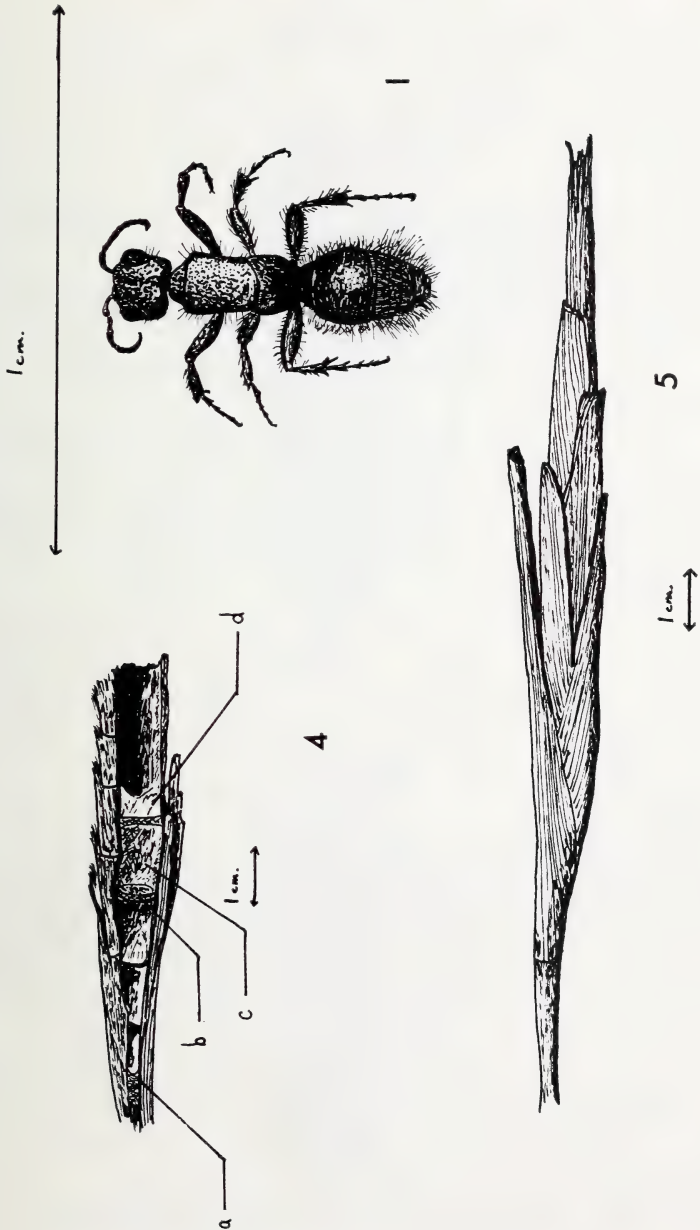


FIG. 1. *Smicromyrme rufipes* female

FIG. 4. Old *Lipara* gall cut open to show cells of *Hylacus pectoralis*

FIG. 5. Gall on *Phragmites communis* caused by *Lipara leucens* after emergence of fly

Halictus alpinus ssp. *perkinsi* Blüthgen 1♂, Ambersham Common 24.viii.75.

Lasioglossum prasinum (Smith) 1♀, Ambersham Common 6.vii.74; 1♀, 5.vi.76; 1♂, 24.vii.76.

L. puncticole (Morawitz) 6♀♀, 3.vii.77; 1♀, 23.vii.77; 1♀, 30.vii.77.

Andrena lapponica Zetterstedt 1♂, Camelsdale, Marley Common. 17.iv.76; 2♀♀, 1♂, Midhurst Common 15.v.77. This species is only found where Bilberry, *Vaccinium myrtillus*, flowers.

A. nigriceps (Kirby) 1♀, Fairlight, Firehills. 26.viii.74; 1♀, Petworth, Upperton Common. 30.vii.75; 1♀, Storrington, Sullington Warren. 2.viii.75.

A. tarsata (Nylander) 3♂♂, Ambersham Common, Bramble Flowers. 6.vii.74.

A. hattorfiana (F.) 2♂♂, Lewes, Castle Hill National Nature Reserve, *Centaurea nigra* 29.vi.75; 2♀♀, *Knautia arvensis*. 3.viii.75. There is a strong, but very local colony, on the bank bordering the southern edge of the reserve for about one hundred and fifty metres where this species was the commonest Aculeate but I found no specimens outside this bank area.

A. marginata F. 1♂, Alfriston, Lullington Heath National Nature Reserve.

A. nitidiuscula Schenk 1♀, Ditchling Common, Hogweed, *Heracleum sphondylium*, 21.vii.74; 1♂, Coolham, Wild Carrot (*Daucus carota*) 21.vi.75; 1♀, 2♂♂, St. Leonards, Filsham Reed Beds Nature Reserve, 10.vii.76.

A. falsifica Perkins 1♀, Ambersham Common 27.v.74; 1♀, Kingley Vale N.N.R. 2.vii.77.

A. congruens Schmeideknecht. Either this species is becoming dramatically commoner than it used to be, or it has been overlooked in the past. I have more specimens and localities for this species than for the supposedly common *A. dorsata* (Kirby). These are Midhurst, including my own garden, Midhurst Common, Chichester, Rogate, Arundel and Fittleworth. The number of specimens may be accounted for by the fact that *A. dorsata* is usually found in ones or twos whereas *A. congruens* tends to be more plentiful where found; perhaps it is colonial.

Melitta tricincta Kirby 2♂♂, Castle Hill N.N.R. 23.viii.75; 2♂♂, Lullington Heath N.N.R. 4.viii.76. 2♂♂, Harting Downs 18.viii.75. 1♀, 1♂, 3.viii.76. This species in my experience, is always associated with Red bartsia flowers, *Odontites verna*.

Megachile maritima (Kirby) 1♀, Pagham dunes 26.vi.75; 1♀, 3.vii.75. 1♀, 2♂♂, 29.vii.75; 1♀, Camber dunes. 10.vii.76

M. argentata (F.). 2♀♀, 3♂♂, Pagham dunes. 26.vii.75; 1♂, 6.vii.77; 2♀♀, 2♂♂, West Wittering, East Head dunes. 1.vii.75.

Coelioxys conoidea (Illiger) 1♂, Pagham dunes 26.vii.75; 1♀, 1♂, Sea Bindweed flower, *Calystegia soldanella* 3.vii.75; 2♀♀, 29.vii.75.

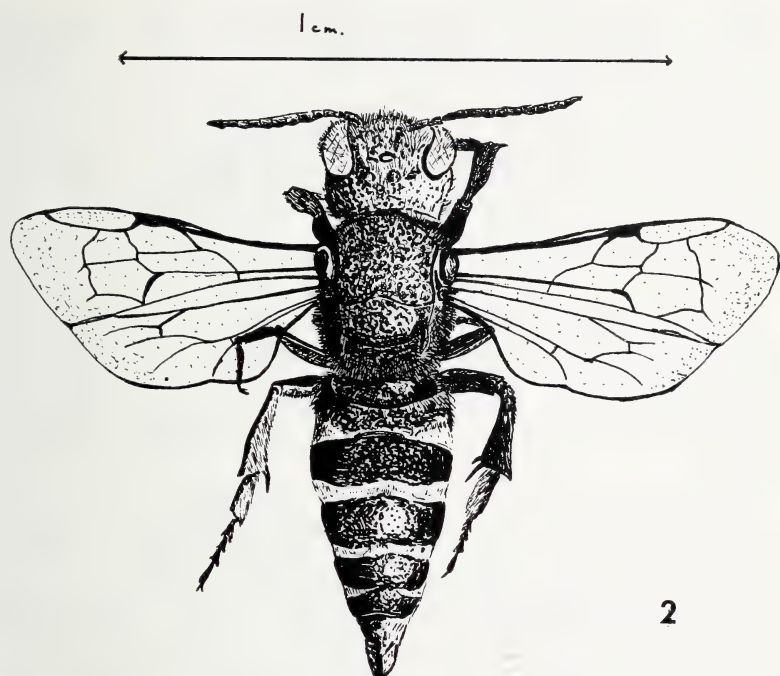


FIG. 2. *Coelioxys rufescens* female

FIG. 3. *Hylacus pectoralis* female

Coelioxys species are usually cleptoparasites of *Megachile* species. I have, however, bred *C. quadridentata* (L.) from a stem containing *Anthophora furcata* Panzer cells and taken *C. rufescens* (Lepeletier and Serville) from a bank populated by *Anthophora bimaculata* Panzer. I made several visits to this bank during 1974 and saw no sign of *Megachile* species but up to ten *Coelioxys rufescens* investigating the *Anthophora bimaculata* burrows. I was unable to pursue this any further as the bank was destroyed by pipe-laying that winter.

Stelis punctulatissima (Kirby) 1 ♀, Heyshott, 26.vi.76; 1 ♀, Midhurst, 15.viii.77.

S. ornatula (Klug) 1 ♀, Kingspark Wood, 23.vii.77; 1 ♂, Ambersham Common, 2.vii.77. This species is another example of the effect of two hot summers in a row. I had searched Ambersham Common, which is an extremely good locality, for its host *Hoplitis claviventris* (Thompson), for several years but only this year, 1977, did I manage to collect a specimen.

Osmia bicolor (Schrank) 1 ♀, Arundel Park, 5.vi.77.

Hoplitis claviventris (Thompson) 1 ♀, Kingley Vale N.N.R., 2.vii.77; 1 ♂, Arundel Park, 5.vi.77; 1 ♀, Midhurst, 13.viii.77; 2 ♀ ♀, 1 ♂, Kingspark Wood, 3.vii.77; 1 ♀, 23.vii.77; 1 ♂, 30.vii.77.

Bombus muscorum (L.) 1 ♂, Printhead, 27.viii.75; 1 ♀, Pagham, 26.vi.75; 1 ♂, Castle Hill N.N.R., 23.viii.75.

Psithyrus rupestris (F.) 5 ♂ ♂, Castle Hill N.N.R., 23.viii.75; 1 ♂, Brighton, Devil's Dyke, 2.viii.76; 1 ♂, Lullington Heath N.N.R., 4.viii.76.

I should like to thank the British Museum (Nat. Hist.) for access to the Hymenoptera collection and the following for help with identification and nomenclature; G. R. Else, K. M. Guichard, M. Day, Professor O. W. Richards.

M. Edwards (5248)

AN EXPEDITION TO THE MASSIF CENTRAL, FRANCE

Following a very successful trip to Var in the Spring of 1976 I arranged for a second expedition in 1977 to an area of France which I had not visited before, the mountain group known as the Massif Central, separated from the Alps by the rift of the Rhone valley. Russell Bretherton advised that the month of July would be the most rewarding for insects and after some canvassing, a small party of six was assembled. Only myself and David Marshall remained of the 1976 party and we were joined by Russell Bretherton, Ron Dyson, Peter Ashdown and Keith Porter, the two last named taking a break from their University studies. Transport was again to be my Commer Wanderer and to this we added two tents for sleeping accommodation. Food sufficient for the trip was loaded plus all our baggage and collecting gear and 15 gallons of stand-by water. The main rendez-vous was at my house and on the morning of the 4th July at 9.30 am we drove off, laden to the gunwales.

towards Ramsgate where we were joined by Keith who had just returned from a trip to Ireland. We boarded the Hoverlloyd hoverplane at 2.45 pm



and at 4.15 pm (French time) we were on the road towards Boulogne and via Abbeville to camp for the first night in an old chalk quarry just north of Poix. Thunderstorms threatened but avoided us as we had a meal of sausages at a camp fire and ran our battery-powered MV lamp for a short time before going to bed. Round the chalkpit we found several Burnet pupae on the grasses and the butterflies *Aphantopus hyperantus* L., the Ringlet, *Pyronia tithonus* L., the Gatekeeper, and *Maniola jurtina* L., the Meadow Brown. The following morning we were away early to find that the roads to the south were very wet from the storm. Stopping in a woodland north of Mantes we saw a male *Apatura ilia* L. sipping at a puddle and took specimens of the Hairstreak, *Nordmannia ilicis* Esp. We crossed the Seine at Mantes and made our next stop for lunch in the Forest of Rambouillet. It was a roadside halt but proved to be rich in insects. On the flowering Privet bushes we took two female *Strymonidia pruni* L., the Black Hairstreak, saw another *A. ilia* and took specimens of the Marbled White, *Melanargia galathea* L., the Common Blue, *Polyommatus icarus* Rott., the Copper, *Lycaena phlaeas* L., the Small Skipper, *Thymelicus sylvestris* Poda, the Small Heath, *Coenonympha pamphilus* L., flying with *C. arcania* L.; *Argynnis paphia* L., the Silver-washed fritillary flew along the roadside and we also saw *Papilio machaon* L. and the Black-veined White, *Aporia crataegi* L. The big find here was the localised woodland Skipper, *Heteropterus morpheus* Pall., which was netted by Keith. After our bread and cheese lunch washed down with wine we left and ran into rain at Bourges but by the time we reached the upland village of Evaux les Bains the evening was clear and we used the little camp site on the edge of the village.

We were now within striking distance of our first collecting area, the Mont Dore region of the Massif. Next morning we left at an early hour and stopped at the top of the Col de la Croix Morand. Here the sunshine was a little fitful and there was quite a cold wind blowing. It was immediately clear that the season was late, as indeed it was in England, and apart from watching a Small Tortoiseshell, *Aglais urticae* L., laying its pile of eggs on the topmost leaf of a nettle, I saw little of interest. The rest of the party also had little luck and we drove down the pass towards the village of Chambon du Lac, stopping about 1,000 ft lower down to collect on the steep open slopes beside the road. Here the grasses were alive with the bobbing forms of the Erebia, *E. epiphron* Knoch, *E. oeme* Hubn., and *E. meolans* de Prun., of both sexes and clearly recently emerged. Also present were a large number of other species of butterfly including the Copper, *P. hippotoë* L., the Blues, *Lysandra bellargus* Rott., *Polyommatus icarus* Rott., a single rubbed *Philotes baton* Bergstr., *Aricia agestis* Schiff., *Cyaniris semiargus* Rott., and one *Maculinea arion* L.; the Satyrs, *Coenonympha arcania* and *C. pamphilus* L., *Lasiommata megera* L., *Pyronia tithonus* L. and *Aphantopus hyperantus* L. and the Skippers, *Ochlodes venata* Brem. et Grey., *Thymelicus sylvestris*, *Pyrgus malvae* L., *P. serratulae* Rambr., *Erynnis tages* L. and *Carcharodus*

flocciferus Zell. I also observed the Red Admiral, *Vanessa atalanta* L., and the Painted Lady, *V. cardui* L. We spent some time here and then dropped amongst woodlands bordering the roadside slopes. Immediately we spotted specimens of the Small Apollo, *Parnassius mnemosyne* L., flying along the roadside in the company of *A. crategi*. The former were all past their best and appeared to be all males. Behind the trees bordering the roadway I found a small sloping meadow and here there were Marsh Fritillaries, *Euphydryas aurinia* Rott., flying with *Clossiana selene* L. and *C. euphrosyne* L., *Mellicta parthenoides* Kef. and *Melitaea diamina* Lang. There were also several male Orange-tips *Anthocaris cardamines* L., and the Copper, *Heodes tityrus* Poda. Due to the steepness of the slopes here, collecting was difficult and we drove on to the village where we found a nice little meadow campsite beside a stream. The plumbing arrangements were a little primitive as the stream was diverted across the corner of the site and over it were sited the toilets—I expect the trout appreciated it. In the evening sunshine I walked with Ron up the path behind the campsite which led beside a steep limestone slope. There were some clumps of Orpine growing here, *Sedum telephium* L. and I saw a butterfly hovering over one of the flower heads. It turned out to be the localised Blue, *Scolitantides orion* Pall., one of the best catches of the trip. There were a lot of *A. crataegi* here, some in copula, and a few Adonis Blues, *L. bellargus*, one being the *ceronus* form of the female. There was some rain in the night but the morning dawned bright and it was soon quite hot as we took the van up the narrow road leading into the Val de Chaudfour above which stands the Puy de Sancey, still decked with drifts of old snow. This is a valley full of flowers, partly wooded with meadows and streams. The meadows are thick with the Bistort, *Polygonum bistorta* L., and here we hoped to find specimens of the small Copper, *Lycaena helle* Schiff. We left the van near the head of the valley and walked up the track towards some derelict buildings where flowers abounded. Butterflies were everywhere and the three *Erebia* species taken on the previous day were very common. I netted a specimen of the Blue, *Eumedonia eumedon* Esp., on its foodplant, the Field Geranium, *Geranium pratense* L., and then saw my first *L. helle* sunning itself on the flowers of Bistort. Subsequently we saw a lot more, the females in good condition and ovipositing, the males well worn for the most part. I watched a female lay an egg on the underside of a Bistort leaf, one of the large lower leaves and then, by searching, found about 28 eggs, all laid singly, in an area of a few square feet. Obviously the butterfly had been on the wing for some time and was very numerous in this area. Where the Bistort is cut with the meadow hay we did not observe the butterfly but in those spots where the plant was undisturbed it was thriving. The eggs found hatched before our return to England and there I fed them on *P. persicaria* L., as an alternative, and this was accepted immediately. Unfortunately as the larvae grew they began to disappear and it was clear that the larvae are cannibals. I was left with

one large larva which pupated on the 15th August. It would seem that the insect is at least partly double brooded in this locality and any eggs deposited on plants in the hay meadows would be destroyed and hence no second brood could emerge. For the survival of the butterfly it is necessary that there should be areas of undisturbed vegetation.

Sunning themselves on the damp pathway I found several male Chequered Skippers, *Carterocephalus palaemon* Pall., and around the bushes I observed both the White Admiral, *Limenitis reducta* Stdgr., and the Large Tortoiseshell, *Nymphalis polychloros* L., newly emerged. I took a nice aberration of *P. hippothoe*, a female with large blue lunules on the underwing. We walked back down the valley to have our lunch of bread and cheese, washed down by wine, on the grassy banks above our parking spot. Butterflies were everywhere around us and mouthfuls were interrupted by mad dashes with the net to take the Large Wall, *Lasiommata maera* L. or the Blues *Maculinea alcon* Schiff., and *M. arion*. The commonest day-flying moths were the Wood Tiger, *Parasemia plantaginis* L., the Burnet, *Zygaena purpuralis* Brummel and the Clouded Buff, *Diacrisia sannio* L.; we obtained eggs from several females of the latter, which laid quite happily in the pill-box. We returned in the evening to have a look at the Lac at Chambon where we saw quite a few Dragonflies hawking among the reed-beds.

That night it rained hard and was still cloudy when we left next morning, the 8th July, to drive towards the Mountains of the Margeride, via Issoire, Lempdes and Langeac. Near the latter village we stopped to collect on the roadside among the hills. There was a large clump of Viper's Bugloss, *Echium vulgare* L., growing beside the road and this was constantly visited by a stream of Broad-bordered Bee-hawks, *Hemaris fuciformis* L., as many as five or six being present at one time. In a short stretch of road we noted the Scarce Copper, *Heodes virgaureae* L., *N. ilicis*, *Iphiclides podalirius* L., *Mellicta athalia* Rott., the Heath Fritillary, *Brenthis daphne* Schiff., and *L. reducta* as well as many *A. crataegi* and *M. jurtina*. Here we had sunshine but as we drove on across the plateau leading to the Margeride Mts. we ran into the biggest storm I have experienced. The skies opened and released a deluge which changed into a hailstorm as we reached higher ground; it thundered and lightened and the road was awash or thick with huge hailstones. There was nothing else for it but to drive on slowly and we eventually passed beyond the storm's centre to reach the small village of Les Salesses where we were to examine a boggy area known to Russell. The rain from this storm eventually caused a spate in the Gorge du Lot which drowned 19 people, as we learned later, but for us it had soaked most of our baggage on the roof rack and our first job on finding a camp site above the bog was to sort out our tents and clothing before the storm returned. We had a short respite while the sun came out and we made a brief sortie into the bog to assess the position. Much of the area has a partial canopy

of Pine trees and Sallow scrub and there is a large area at one end which is still open. Fencing appears to be a recent addition and some drainage ditches have been dug indicating that the life of this particular habitat may now be limited. In the glades both *C. selene* and *C. euphrosyne* were flying and the dark fritillary, *Melitaea diamina*. All appeared freshly emerged and we found larvae of the last named still present. A surprise was to take several male specimens of the Erebia, *E. ottomana* H-S. This was a butterfly we were expecting to find further east in the Mt. Mezenc region. It is an isolated race *tardenota* Praviel, smaller than the Balkan races which I have from Montengro and Greece and at one time thought to be a race of *E. tyndarus* Esp., a species which does not occur west of the Rhone. In the open areas there were large numbers of the Marsh Fritillary, *E. aurinia*, flying and later we found several batches of eggs. The race here is very poorly coloured though of good size. The marsh was thick with its foodplant, Devil's bit Scabious. While searching amongst this I found a typically built Argynnid larva, almost black with spines and two feeler-like projections from behind the head. This was feeding on the leaves of Bistort and subsequently produced a specimen of *Clossiana titania* Esp. This butterfly was already on the wing and after netting several I eventually found amongst them a specimen of the butterfly which we had hoped to find here, *Boloria aquilonaris* Stichel. This butterfly on the wing was difficult to pick out amongst the other species but in the net is quite distinct, appearing very like its mountain cousin, *Boloria pales* D. & S. It was again obvious that we were a bit too early for the main emergence as the few we did take were males and all freshly emerged. Its foodplant is the Cranberry, *Vaccinium oxycoccos* L., which grew in clumps in the open bog. Other species seen were the Wood White, *Leptidea sinapis* L., *Erebia meolans*, and a few male *Mellicta parthenoides*. Suddenly the storm returned and we hurried back to the shelter of the tents and van. As the rain abated we were disturbed by a group of youngsters from the village who were selling special loaves for the coming 14th July festivity. We bought one and spent a fairly uncomfortable night. The 9th July dawned heavy with mountain mist; we were at about 4,000 ft. However it slowly cleared and we had hot sun for a further foray into the bog. On the slopes above the bog a Hen Harrier was quartering the ground with slow wing beats, calling in alarm at our presence. We added two further species to the list, the Hairstreaks, *Callophrys rubi* L., badly worn and *Quercusia quercus* L., freshly emerged. I took a female Fox Moth, *Macrothylacia rubi* L., resting on the grasses and Keith found a female Oak Egg, *Lasiocampa quercus* L., which attracted one male which David netted but no others arrived. Subsequently it laid a pill-box full of eggs which hatched on my return to England so she must have been mated immediately on emergence as her wings were hardly dry when Keith found her. In the late morning we packed camp and drove via La Bastide to the top of the Col de Meyrand in the Ardèche by a long and twisting road which was so steep that we

did long distances in bottom gear, with constant fear that the next stretch would be 'get out and push' gear. At last we reached the top of the pass in a swirling mist which slowly cleared to give us some sunshine. We were again too early for this locality and the only species on the wing was the ubiquitous *E. meolans*. We had hoped to find *E. ottomana* here so moved lower, onto the far side of the pass, to some flowery meadows. A few butterflies were on the wing here in the evening sunshine—a few male *E. ottomana*, *Erebia euryale* and a lot of *P. plantaginis*, several of the form *hospita* with the yellow replaced by white. We then drove down nearer to the bottom of the pass and found a roadside camping place beside a river running in a little gorge. During the evening Peter and I tried for trout in the stream, using grasshoppers and leeches for bait. Peter took one which he cleaned ready for breakfast but during the night something stole it. This was a delightful spot with damp flowery meadows rising above the roadway broken with clumps of trees and bushes. By 8.30 am the next morning the sun was very hot and we dried out thoroughly and then ranged the slopes. The meadows were alive with *E. ottomana*, mostly males, *M. parthenoides*, several *M. phoebe* Schiff., *Pyrgus malvae* and *P. serratulae*, *E. euryale* and *A. crataegi*. David caught a large viper which he put in a bucket for us to see on our return. After lunch we took a less arduous route back to La Bastide and after a short stop again at Les Salesses where we added *Brenthis in Rott.*, to our tally we drove at 4 pm towards Mende to camp the night by the river north of Balsieges below the Causse Sauveterre. In the camp site Ron took a female *Colias crocea* Geoff., and a new Blue, *Plebicula escheri* Hubn., which is very like a large Common Blue and by the river there were a lot of specimens of a very beautiful Agrion damselfly. On the next day, the 11th, the sun continued to shine and we drove up through Balsieges onto the Causse Sauveterre. This is on the edge of the National Park of the Cevennes and an area rich in insects. The Causses are high limestone pavement areas with fairly sparse bush and tree growth but rich in flowers growing in the crevices and pockets amongst the limestone. We made a halt off the road as we reached the Causse and the slopes were alive with butterflies and Burnet moths. The Fritillaries were represented by *M. parthenoides* and *M. deione* Geyer, (the latter at first confused with the former) *M. didyma* Esp., *M. phoebe*, *Fabriciana niobe* form *eris* Meig., and *M. cinxia*; the Blues by *M. arion*, *P. escheri*, *Lycaeides idas* L., *Plebejus argus* L., *P. icarus*, *Cyaniris semiargus*, *N. ilicis* and *N. acaciae*; the Skippers by *P. carthami* Hubn., *Spialia sertorius* Hffsgg., *T. lineola* Ochs, and *T. acteon* Rott.; amongst the Whites were *Colias australis* Verity and *C. crocea*, *Pontia daplidice* L. and hundreds of *A. crataegi*; *I. podalirius* was still on the wing and the Satyrs included *C. pamphilus*, *C. arcania* and *C. dorus*, *Hipparchia alcyone* Schiff., and amongst the swarming *M. galathea* were a few *M. russiae* Esp. The burnets were represented by four species. Here we found batches of the eggs of *A. crataegi* on both Sloe, *Prunus spinosa*, and Hawthorne.

Crataegus sp. laid on the upper side of the leaf in little bright yellow piles. On the Sloe we also found eggs and larvae of *I. podalirius*. By the roadside I netted a female *Heodes alciphron* form *gordius* Sulz., but unfortunately while I was getting a pillbox it escaped. We decided to drive on to explore further, and near the village of Sauveterre we were fortunate to meet a French entomologist who stopped on seeing our nets and helpfully indicated that if we tried the high open plateau we should find *Parnassius apollo* L. newly emerged. We found an area of suitable ground just beyond the village and found *M. russiae* very common, replacing *M. galathea* almost completely. This species flies much faster and is much more difficult to net. After ranging over a very wide area in the hot sun five specimens of *P. apollo* were taken and several more were seen. The foodplant is a *Sedum* species which is widespread over the limestone terraces and the butterfly would also appear to be thinly spread over the whole area. The habitat is quite unlike those I have experience of elsewhere, even in the limestone Karst area of Montenegro, but the race does not appear to differ from those in Alpine France. It would be of interest to know what its larvae are like but the only female taken was unmated. An interesting find was a large group of Horse mushrooms, the youngest of which were about the size of a dinner plate and made good eating later. Towards evening we took the road south towards the Gorge du Tarn and almost fell off the plateau down a steep and winding road to the village at the bottom of the gorge, St. Enimie. The gorge is quiet spectacular with steep craggy sides and a wide clear river tumbling at the bottom. We took the road on the north side of the gorge towards the ancient town of Le Rozier, a winding road on which the approaching cars travelled at high speed and gave us little quarter. At 6.30 pm we found a fine camp site on the north side of the river from Le Rozier at the foot of the bridge which spans the stream. This was the nicest of our camp sites being warm and clean with the river at our doorstep. At dusk several Mid-wife toads started calling along the river bank and with the aid of a torch Peter and I captured one and placed it outside the tent. Its plaintive bell-like note continued until daybreak.

On the 12th July we spent the day above Le Rozier on the Cap Luc, a stony hillside topped by an ancient building. Here we found many of the species met with on the Causse Sauveterre with many additions, the total score for the morning being more than 50 species. The bushes were alive with the beautiful Hedge Brown, *Pyronia bathsheba* Fab., and every bush of wild lavender had a group of Hairstreaks, *N. ilicis* and *S. spini* Schiff., the latter being the commoner. We saw the Long-tailed Blue, *Lampides boeticus* L., the Holly Blue, *Celastrina argiolus* L. and *Plebicula dorylas* and several male and female *Gonepteryx cleopatra* L., the slopes being liberally spattered with bushes of its food plant *Rhamnus alaternus* L. which were in full berry. The three large Satyrs, *H. semele*, *H. alcyone* and *Brintesia circe* Fab. hawked around the rocky outcrops

and Keith took a single male *Satyrus ferula* Fab. The Fritillaries included *M. athalia*, *B. daphne* and *M. didyma* and I took a nice underside aberration of the last. There were a few newly emerged *N. polychloros* visiting the *Centranthus* flowers on the ruin and several *L. reducta* patrolled the paths through the bushes. I took some specimens of the Skipper, *Carcharodus lavatherae* Esp., which were buzzing about over the stony path. Along the pathside there were large clumps of garden Fennel and on the higher ground these produced larvae of *Papilio machaon* in all stages of growth, the largest being at the base of the plants. Later several turned out to be parasitised. The commonest bush on the slopes was the mountain Sloe, *Prunus mahaleb* L., and this proved to be the favourite foodplant for the Scarce Swallowtail, *I. podalirius*. We found eggs, small and large larvae. The larvae have a whitish band in the first instar and are quite easy to see but after that they are green and more difficult to locate. They sit in the upper side of the leaf until nearly full grown when they move on to the stem, looking like a leaf. At this stage they will vibrate slowly when disturbed, simulating a quivering leaf. This was the richest area in species that we had visited despite the dryness of the slopes. Later in the day as we individually made our way back to the camp site I came upon a rough meadow in which several *M. arion* were flying. I had not observed any Thyme on the slopes, nor this butterfly, and after some observation it was clear that the foodplant here was the Marjoram, *Origanum vulgare* L., of which there were large clumps which the butterfly was visiting. I took one female and some flower heads in the hope of obtaining some



Collecting in the Massif Central. Lunchtime at Les Salesses (left to right)
Messrs P. Cribb, P. Ashdown, D. Marshall, K. Porter, R. Bretherton

eggs but the very hot sun the next day killed the butterfly while we were out. That evening a big storm came up and we just managed to have a swim in the river and prepare the evening meal before it broke. In the morning the sun was hot again and Peter observed trout and barbel in the deep water just below the camp. The river is a great place for fishermen, who seem to catch nothing, and large groups of canoeists who come down the stream shooting the rapids. We spent the day on the top of the Causse Noir which lies to the south of Le Rozier. It is fairly heavily planted with Pine, hence its name, but these are not dense, so that insects occur in the clearings. The special quarry here was the Small Heath, *Coeononympha glycerion* Borkh. (= *iphis* Schiff.) which we found commonly, flying with *C. dorus*, *C. pamphilus* and *C. arcania*. Russell took a good Burnet, *Z. rhadamanthus* Esp., but we failed to find the Blue, *Agrodioetus dolus* Hubn., probably being too early. Several Queen of Spain Fritillaries, *Issoria lathonia* L., were flying over rough meadowland and *A. crataegi* swarmed everywhere. Again we collected their egg batches and a lot of *I. podalirius* larvae. In this area the ground was often carpeted with Thyme and there were a few *M. arion* seen and large numbers of *P. argus*. After a hot day we returned to swim in the river and sort out our catches. The back of the van had earned the name of 'maternity ward' with its assortment of boxes, cages and tins in which *Erebia* spp., *Mellicta* spp., various Satyrs and Fritillaries were laying. These had to be kept partly shaded to prevent the death of the occupants from the hot sun, watered and checked daily, and herbage renewed as necessary. In addition there were larvae to feed so that all were kept fairly busy.

On the 14th the time had come to start our trek back northwards in which we would visit our last particular area. We followed the eastward course of the gorge and then struck northwards towards St. Flour whose citadel dominates the surrounding countryside. Just short of the town we stopped to collect and eat our lunch by the roadside. Quite a few butterflies were on the wing. Keith caught a female *I. lathonia* which subsequently laid eggs for him and I took a very large female *B. ino*. We then passed on through Murat to climb the pass towards Le Lioran below the Plomb de Cantal where our quarry was the localised *Erebia*, *E. sudetica* Stdgr. When we got to the top of the pass above the road tunnel and could see the slopes on which we hoped to collect they were shrouded in cloud into which the cable car which runs to the peak was disappearing. It certainly did not look very inviting and there appeared to be no suitable camping place here. However our luck held and we found a small side road which led into a valley where we could see a few tents. Here we discovered a suitable flat area near the forest, which covered the north facing slope, and made ready to pitch our tent. As I got out of the van I saw a dark butterfly fluttering by the roadside and was able to pick it up in my hand. It was a male *E. sudetica*. This happy omen was to save us a lot of hard climbing on the morrow. We

built a fine camp fire and although it rained that evening and the temperature was a sharp contrast to that at Le Rozier we ate and slept well. The next morning, the 15th July, the whole valley was thick in mist but by 10 am the sun had broken through and we were able to collect on the slopes. By now we were used to wet feet and a walk through the long grasses on the south facing slope produced an interesting lot of butterflies. The *E. sudetica* (males only as yet) and *E. epiphron* were sitting on the grasses with their wings open absorbing the sunshine. Also present were *E. meolans* and *E. euryale*, *C. selene* and *C. euphrosyne* and several Purple-edged Coppers, *P. hippothoë*. Several fresh Dingy Skippers, *Erynnis tgaes* L., were flying with *T. lineola*, species that would not be on the wing together in England. About mid-day we packed camp and drove north towards Marat via the pass below the Puy Mary where we stopped to eat and net a few *E. epiphron*. Over the pass we again stopped on the road to collect on the sunny south facing slopes above the road, both *E. epiphron* and *E. meolans* being very common. By evening we had reached Aubusson and camped in an open field beside a wood of deciduous trees. The weather continued to be kind and before leaving next morning we went down into the wood into a clearing where we saw *B. daphne*, *L. camilla*, the southernmost of the places we found it, many *M. galathea* and *N. ilicis*. Ron found some larvae of the Shark, *Cucullia verbasci* L., on Mullein and I filled up with wild raspberries. Our journey then took us on through Issoudin and Vierzon. In the Forest of Vierzon we made a halt for lunch and found *H. morpheus* flying in the glades and clearings under the Pines. As our target for the next day was the Forest at Rambouillet we did not linger and taking the direct route through Orleans we at last reached Rambouillet. After some exploration we found that 'camping sauvage' was only permitted in certain areas of the forest and found a perfect site near St. Leger under massive oaks near to a forestry residence where there was a stand-pipe. There were small dark pools nearby in the forest and glades and paths leading off in several directions. I awoke on the morning of the 17th to the sound of rooks all around the van and a golden oriole calling nearby. The sun was already hot as we split up to explore the various rides. I found a larva of the Gypsy Moth, *Lymantria dispar* L., and a newly emerged Scarce Green Silver-lines moth, *Pseudoips prasinana* L., and there were a few Heath fritillaries, *M. athalia*, skimming about in the glades under the oaks where Cow-wheat carpeted the ground. In one clearing there was a large group of Aspens growing and as the sun caught the tops of them a host of White Admirals, *L. camilla*, began to flutter round them. I observed one pairing and several pursuits. Later in the day almost every bramble patch in the rides had one or two of this species around it where they were joined by Silver-washed fritillaries, *Argynnis paphia* L. We then decided to have a look at our first stopping place in the forest where we had taken the *H. morpheus*. We found it fairly easily and in the

clearing where the coarse woodland grasses flourished there were a lot of *morpheus* of both sexes. I found a newly emerged female drying its wings on one of the clumps of grass which covered the clearings. The grass most abundant was a *Brachypodium* sp., probably *B. sylvestris* but there was also a broader leaved species present which might also have acted as a foodplant. Russell later obtained eggs from a female and these he found would only take to some coarse woodland grass growing in his garden. There were still a few *S. pruni* about but the majority of Hairstreaks were *N. ilicis* with a few *Q. quercus*. *N. polychloros* and *A. paphia* were visiting a large group of tall thistles in company with one or two *G. rhamni*. Skimming round the van and landing on the road were a couple of male *A. ilia* and Keith was fortunate to net one as it whizzed by. After lunch we drove across the forest via Rambouillet to the Etang St. Hubert as we understood that to be a good area for the Apaturidae. The lake there is a huge one, fringed with great beds of reeds and the woodland lies around the lake. There were Great-crested Grebe and Coot on the water and several *A. paphia* were visiting brambles growing amongst the reeds. By the van several *L. reducta* were seen and I netted a single female White-letter Hairstreak, *Strymonidia w-album* Knoch, which was flying around some Common Elm, already partly killed by Dutch Elm disease. We had observed the effect of the disease widely in our travels and the future of this butterfly must be in jeopardy on the Continent also. The ride which led into the woodland produced a feast of butterflies. Dozens of White Admirals, *L. camilla*, swarmed on the bramble with the Silver-washed fritillaries and Keith netted a single very large female Purple Emperor, *A. iris* L. This we boxed and later in a large cage in my garden it laid some forty eggs before dying. We were now getting near the end of our stay in France and at about 4 pm we continued our journey north to recross the Seine again at Mantes and camped the night in a large chalkpit south of the village of Marseille. Here we took a specimen of *Zygaena carniolica* Scop., and observed a few female *P. icarus*. We experienced a very windy night and next morning we drove off into a rainstorm which stayed with us until we reached the outskirts of Boulogne. Although we had intended to spend a day exploring in this area the weather seemed too unsettled and by paying an extra fee we were able to take an immediate Hovercraft from Calais to arrive back in England a day ahead of schedule.

We had had an interesting and fruitful trip in which we recorded 111 species of Rhopalocera, 101 of which occurred within the Massif Central area. Travel and insurance arrangements were made through the Camping Club under their Carefree Travel scheme and the total cost to each member, including food, petrol, camp fees and wine, was £65. I would like to record my thanks to Russell Bretherton for his help in navigation and finding the 'right' spots and to David Marshall for his assistance

in driving and to all the party for their company and forbearance in the face of my cooking.

Subsequent checking of notes of members of the party has resulted in the following additional records of interest.

Limenitis populi L. Seen by Russell in the entrance to the Val de Chaudfour.

Mesoacidalia aglaja L. and *Fabriciana adippe* Schiff. flying by the roadside near Langeac.

Pararge aegeria L. In the Forest of Rambouillet and at Les Salesses.

In both places of the typical European form.

Pyrgus species: *P. cirsii* Rambur, *P. serratulae* and *P. fritillarius* in the Causses.

It is hoped that the results of some of the breeding of species taken on the trip will be recorded in future issues of the Bulletin.

P. W. Cribb (2270)

ON PUPAE IN BIRDS NESTS

Reading through a number of old editions of the Bulletin in early 1976, I came across the observation of a pupa of the Clouded-bordered Brindle—*Apamea crenata* Hufn. in a Song Thrush's nest, sent in by Miss Wendy Russ (Russ. 1965). In her letter, Miss Russ suggests that a bird's nest is surely a very unusual place for a caterpillar to pupate, and on the surface this certainly seems so, particularly as the Song Thrush's nest in which the pupa was found was three feet up in a hedge and the larvae of the Clouded-bordered Brindle feeds on various species of grasses. The thought occurred to me that the pupa may have come from a larva which had originally been taken to the nest by a parent bird collecting food for its brood. If the larvae were full grown at the time and subsequently, for some reason, eluded the gaping gullets of the fledglings, the occurrence of its pupation in nest material becomes less unusual. The life-cycle of the Clouded-bordered Brindle is such that larvae are fully grown in April or May, when the Song Thrushes would have been rearing their brood, and this at least is in accordance with the proposed theory. However, Miss Russ states that the Song Thrush's nest was old. Whether this infers merely that the fledglings had flown, or that the nest had been made more than a year previously is not made clear. Obviously, the hypothesis put forward above can only be true if the former were the case, as I can find no records of the Clouded-bordered Brindle passing the winter as a pupa.

In the spring and early summer of 1976 and 1977. I decided to examine old and new birds' nests for Lepidoptera pupae. Accordingly, in March, April and May 1976, I sought out thirty nests, fifteen of which had been made at least a year previously, and which were no longer being used, the others being still occupied when first discovered. These latter fifteen nests were kept under observation in the ensuing weeks until

RESULTS FROM NESTS KNOWN TO BE OCCUPIED IN 1977

Species of bird	Situation	Approx' Height above the ground	Number of pupae	Species of pupae
Blackbird	Privet Hedge	4 feet	0	
Blackbird	Privet Hedge	4 "	0	
Starling	Holly	7 "	2	Mottled Umber (<i>Erannis defoliaria</i> Clerck.) Heart and Dart (<i>Agrotis exclamatoris</i> L.)
Starling	Holly	6 "	0	
Starling	Holly Hedge	5 "	1	Large Yellow Underwing (<i>Noctua pronuba</i> L.)
Starling	Privet	4 "	0	
Starling	Cypressus	6 "	1	Angleshades (<i>Phlogophora meticulosa</i> L.)
Starling	Hawthorn	5 "	0	
Starling	Clematis Creeper	8 "	0	
Hedge Sparrow	Box Hedge	3 "	0	
Hedge Sparrow	Yew Hedge	3 "	1	Winter Moth (<i>Operophtera brumata</i> L.)
Hedge Sparrow	Hawthorn Hedge	4 "	0	
Hedge Sparrow	Hawthorn Hedge	3 "	0	
Song Thrush	Laurel	6 "	0	
Robin	Yew Hedge	3 "	0	
			Total	5

Table 1. Number and type of pupae found in birds nests known to have been occupied by birds shortly before their examination. (No pupae were found in the old nests examined.)

RESULTS FROM NESTS KNOWN TO BE OCCUPIED IN 1976

Species of bird	Situation	Approx' Height above the ground	Number of pupae	Species of pupae
Blackbird	Laurel	7 feet	0	
Blackbird	Cypressus	5 "	0	
Blackbird	Privet Hedge	4 "	0	
Starling	Rhododendron	6 "	1	Large Yellow Underwing (<i>Noctua pronuba</i> L.)
Starling	Holly	6 "	0	
Starling	Holly	5 "	1	Medium sized pupa. Did not hatch (probably Noctuid)
Starling	Laurel Hedge	6 "	2	Angleshades (<i>Phlogophora meticulosa</i> L.) Hebrew Character (<i>Orthosia gothica</i> L.)
Starling	Laurel Hedge	6 "	0	
Hedge Sparrow	Box Hedge	4 "	0	
Hedge Sparrow	Hawthorn Hedge	4 "	1	Winter Moth (<i>Operophtera brumata</i> L.)
Hedge Sparrow	Hawthorn Hedge	3 "	0	
Hedge Sparrow	Privet Hedge	4 "	1	Winter Moth (<i>Operophtera brumata</i> L.)
Song Thrush	Clematis Creeper	6 "	0	
Song Thrush	Laurel Hedge	6 "	0	
Robin	Hawthorn Hedge	3 "	1	<i>Tortrix viridana</i> L.
			Total	7

the fledglings had flown, and the nest remained deserted for at least four days. As each nest was deserted it was brought in for examination together with one of the old nests. Where possible the old and new nests brought in together were of similar type and from a similar situation. The nest material was carefully sifted and any pupae found were taken out and kept until the imagines emerged. A similar process was repeated in 1977. The work was carried out in and around Englefield Green in Surrey.

The number and type of pupae found in each of the new nests, and the sites of these nests are given in Table 1. No pupae were found in any of the old nests.

The results of this simple study indicate strongly that larvae only pupate in birds nests when these are, or have very recently, been occupied, which tends to support the hypothesis under investigation. Taking the hypothesis to be true, the study also shows that examination of recently deserted birds nests may provide information on some of the species of larvae that various birds take whilst feeding their brood.

Michael E. N. Majerus (4027)

REFERENCE

RUSS, W., 1965. Letters to the Editor. *Bull. amat. Ent. Soc.* 24. 68.

THE PURPLE EMPEROR, *APATURA IRIS* L.

A FEW BREEDING NOTES

Arising from our trip to the Massif Central in July 1978 Keith Porter captured a female Purple Emperor, *Apatura iris* L., in the woods near Rambouillet on our way back. This I kept alive in the refrigerator and released into a large cage in my garden on our return. The cage is of simple construction being a skeleton of a box 5ft. 6ins. high by 4ft. x 4ft. made of 2ins. x 1½in. timber with cross supports on one side forming a doorway into which is fitted a closely fitting door frame. The sides are covered with very fine mesh nylon, the bottom is solid waterproof ply and the top is a sheet of clear plastic sheeting. All joints are insect proof but somehow Earwigs seem to be able to get in through the door fitting. It stands in my garden under a tree so that it is partly shaded and additional shade can be added by laying opaque sheets on the top or sides. Inside there was a small potted Sallow, *Salix caprea* L., standing in a trough of water. A tray of rotting manure, well watered, was placed on the floor and the butterfly inserted. I had fed her on a honey/water solution before so doing and subsequently placed a small oak spray in the corner of the cage which I sprayed with honey water each day. The butterfly seemed quite at home, crawling over the foliage and feeding on the honey water or on the wet manure with her short yellow tongue and after three days I observed three eggs on a leaf. They were still green but a day later they had darkened at the base, indicating

that they were fertile. Over the next fortnight she laid a total of 41 eggs; some of these I sent on to Keith. Unfortunately I was unaware that earwigs had got into the cage but the disappearance of some of the eggs, soon after being laid, led me to search the cage and I found several fat specimens hidden in curled leaves. At the end of the fortnight we had a very heavy rainstorm and in the morning I found the female *iris* water-logged on the floor of the cage. I rescued her and dried her out but the ordeal had been too much and the next day she succumbed. On dissection I found only eight further eggs in the abdomen. The female may well have laid some eggs before capture. On a previous occasion I had a female which laid over 100 eggs and Mr. Henry Short (ex litt.) informs me that one female (Hants stock) produced over 400 eggs this year, a phenomenal number. He achieved this by regular feeding. He was also able to mate three females using one male (by hand pairing) and all produced viable eggs.

Of the eggs laid I had twenty eight larvae in the first instar but again suffered losses from earwigs which eat the small larvae as well as the eggs. At the hibernation stage I have eighteen larvae, the majority are stationed on the stem of the Sallow, one or two in the crotches, the rest on the main stem and these are well down the stem near to the ground (one an inch from the ground). Two are stationed on dead leaves still attached to the bush, secured by silk spun by the larvae from the petiole to the twig. Mr. Short has recorded that the larvae will also leave the tree or bush and hibernate in dead leaves on the ground around the foot of the plant. This is not a case of falling off with a leaf but deliberately climbing down and moving into leaves on the ground as he used dried beech leaves in which he subsequently found the larvae. There is obviously a lot still to be learnt about this butterfly. The ability of males to pair with more than one female and the possible high fecundity of females may be important factors in the persistence of the butterfly in its haunts despite reduction of habitats and bad summers. It is an insect seldom seen on the wing even in its best known haunts and it never seems to be present in any numbers.

P. W. Cribb (2270)

MORE THOUGHT ON EXTINCTION AND CONSERVATION

I read with interest Mr. M. D. Bryan's article "A Few Thoughts on Extinction, Rarity & Conservation" in the February issue of the Bulletin last year. I heartily concur with many of the issues raised by him, such as the futility of reintroducing an insect into a habitat in which it was formerly common but had then become locally extinct: the example he quoted being the Black-veined White, it is patently obvious that it died out because of some climatic or other environmental factor, and if these conditions still prevail there is no point in re-introduction. This holds well for "local extinction" of a species and

is to be expected, the structure of the population of any plant or animal is a dynamic situation, never a static phenomenon (and would be a cause for concern if it were!) and hence the loss of species on the edge of their range is to be expected. The "total extinction" of a species is however different matter. Mr. Bryan calls conservation today "fossilisation" and states that the preservation of a species which, without human protection, would be lost entirely, is not acceptable scientific ethic. This accords with Darwin's theory but man has since upset the natural balance in a colossal way, not so extensively in the Brazilian Selvas (yet!) but grossly so in countries like the U.K. Here as Mr. Bryan says is an entirely man-made landscape produced (until recently) slowly over the preceding 5-6,000 years, but over this period species composition has changed and we have no doubt lost many species and yet gained others better suited to the environment man has created; the result is, in a very small area of land, a characteristically diverse flora and fauna, more so probably than it would have been without man's influence. This flora and fauna is however very much dependent on the goodwill of man in order to survive.

Man in the 20th Century has an unprecedented capability to alter or destroy whole environments, but because we have the technology to do this this does not mean that it is right to do it. We have in fact the future survival of every creation on this earth in our hands.

In a man-made environment such as Britain the animals and plants have adapted over a long period to fit in with man's pattern of activity. The Large Blue has survived up till now presumably because the land on which it occurs has always been grazed to allow the survival of the certain species of ant on which the larvae feed; now with a change in farming policy, perhaps because keeping sheep on this type of land is not economically feasible, the Large blue could die out, thus removing forever from the British scene a fascinating interaction between man and animals that has existed for hundreds of years, just because it is no longer economically viable to graze the necessary sheep! Who knows, the economics of sheep rearing may one day allow the grazing of sheep again on this land and if they had been conserved the Large blues would be available to fill the niche, as it is unlikely that we would get a continental migration of this or any other insect unless introduced by man. There is also the question of the loss of genetic material concerned with extinction but I will discuss this later.

With respect to the Osprey, as Mr. Bryan says it is not a rare bird in the world or in Britain now, thanks to conservation; not only are there the much publicised Loch Garten Ospreys but several other pairs are dotted about over the Highlands. The environment is therefore perfectly suitable for this species and it is obviously filling a vacant ecological niche and will probably reach an optimum population if allowed to (although this will still be small); it is also a species which

has not been artificially introduced but arisen as a result of overspill from other areas. All the latter statements are acceptable scientific ethics but if this bird had not been protected, principally by the RSPB, it would certainly not occur in Britain because of the attentions of egg collectors and skin collectors and the persecution of gamekeepers, for no other reason than it is a raptor, these being collectively responsible for its disappearance here in the 19th Century. Because it is a predator at the top of a food chain its numbers are obviously low and therefore more susceptible to human pressures; blackbirds in comparison are under no such pressures because of their sheer numbers and because they are less specialised than the raptors and also not so collectable. If there were no bird protection laws in Britain and elsewhere man could easily make every bird of prey extinct, they could not adapt to the pressure of this sort of extermination but what right does man have to create a sort of avian "final solution"? Finally on the Osprey issue some 100,000 people see the ospreys every year providing valuable funds for the purchase and maintenance of bird reserves, perhaps land that contains valuable habitats (not just the odd rare species) which might otherwise go under the plough or to industry.

On the introduction of non-native animals Gilbert White said in 1789 "The quadrupeds in Britain are so few that every new species is a great acquisition". Many animals in Britain have been introduced—Fallow Deer, Rabbit, Pheasant, Mute Swan, probably by the Romans, and more recently exotics such as Parakeets, Muntjac and Wallaby to name a few; most introductions are now well integrated and accepted members of the natural community. In a small country like Britain most are easily controlled if they get out of hand, but similar introductions have been made in New Zealand and Australia with more disastrous effect, particularly deer in New Zealand where there are no predators to fulfill Darwin's Natural Selection theory and reduce the impact; likewise in Australia homesick expatriates introduced the sparrow (ostensibly to kill insect pests) also starlings, goldfinches, blackbirds, thrushes (the latter two fill a suburban niche quite effectively) and also the fox and the cat, the latter have adapted all too well to the environment to the considerable detriment of the native marsupial fauna. In Britain it is nice to see grey squirrels in our parks and gardens but where I live, adjacent to Epping Forest, control measures are necessary every so often because of the damage done to nesting birds and trees by the unchecked population growth of the grey squirrel. There is no doubt, as a scientific ethic, that the grey squirrel is better adapted to mixed deciduous woodland than is the red squirrel, and it is certain that it is because it was a better competitor that it has taken over while the red squirrel was in decline—but could not this have been a temporary decline, rendered permanent by its being unable to re-colonise its former haunts because of the introduction of the grey by man? Thus I feel any introduction should be looked at with scepticism

until proved that it fills a vacant, and not just a temporarily vacant, niche.

On the conservation/fossilisation issue I would like to remind Mr. Bryan of the recent incredible rate of extinction. Since man appeared wielding firearms and the hoe, species extinction has occurred at a far greater rate than would "naturally" occur, even if the animal was formerly common, an example being the passenger pigeon. When an animal becomes extinct, millions of years of evolution and the genetic inheritance that dictates what the species is, becomes lost for ever. A good case for Mr. Bryan's fossilisation is the Rare Breeds Survival Trust in the Cotswolds, an unusual trust which maintains "old" breeds of livestock. In today's farming climate the emphasis is on a single breed of livestock which is capable of producing the best wool, carcase, eggs, etc. and as a result many of the old breeds of livestock would have disappeared and with them hundreds of years of man-made selection to produce an animal suited to particular and not general farming conditions; but who knows if certain lost characteristics would not be required in the future, i.e. the ability to lamb at any time of the year or to survive on extremely rough pasture. (I believe the Hebridean St. Kilda sheep is able to survive on seaweed for instance); as opposed to having this gene bank alive and available now, I suppose you could wait another several hundred years for these characteristics to turn up naturally out of the current widely used hybrid sheep, but on the other hand the characteristics might not be there!

In conclusion it is scientifically possible for man to destroy everything in his path and live in a vast concrete polynucleated megalopolis (a large town called Britain on the edge of a country called Western Europe), his protein requirements produced inorganically, his carbohydrate coming from a single wheat variety grown in great prairie fields, a horrific make-believe situation because of man's "restructuring capabilities". Hopefully the Conservation movements everywhere will prevent anything even remotely like this happening, until of course the next Ice Age comes along and does it for us!

Mark W. Hanson (4637)

BUTTERFLIES AND THE SPOTTED FLYCATCHER

There are many differences of opinion as to how many butterflies are taken by birds. Butterflies with pecked hindwings are quite common, which suggests they are caught by birds when the insects are at rest, but have managed to escape. Butterflies in flight are more of a problem to most birds due to their erratic flight.

My attention was drawn to the subject this summer by a small family of Spotted Flycatchers (*Muscicapa striata*) that took up residence in my garden. To those not familiar with this bird, its habits are most

aptly described in typical 19th century style as follows, (Aldridge 1885): -

"A sad little bird... of sombre plumage.... Perched on the hedge he looks a picture of dejection, when, all at once, as if struck by a sudden thought, he darts into the air and seizes his prey—a moth, gnat or fly—with unerring aim and returning to his former perch relapses into another fit of despondency, to awake again and go through the same performance..."

The family appeared to comprise at least one, or perhaps two adults and an almost fully-grown fledgling. The birds are exceedingly swift and agile on the wing and can hover well, which is often necessary to capture a butterfly in mid-flight. The technique is just as described by Aldridge, but sometimes flying straight on to a second perch. So swift is the action that it is often difficult to see if it has caught its prey, except, perhaps in the case of a butterfly. The bird often intercepted a butterfly at about 90 degrees to the insect's flight path, but on at least one occasion I saw one catch a *Pieris* head on.

One favourite perch was on a fence immediately by the side of the main buddleia bush where the insects were feeding. I did not see any taken when so doing, but only when they flew either away from, or towards, the bush. Butterflies taken comprised *Pieris brassicae*, *P. rapae*, *Gonepteryx rhamni*, *Aglais urticae* and *Inachis io*. The 'whites' fell an easy prey, the nymphalids had more near misses and surprisingly a *Maniola tithonus* was missed altogether and made off with alarming speed, quite unlike its usual manner of flight.

Several ornithological books describe an audible click as the bird snaps at an insect. This is perfectly true when, on one occasion, a flycatcher dived on the buddleia scattering butterflies in all directions and pursued a Small tortoiseshell so close to me that I heard the click distinctly. Usually the butterfly's wings are clipped off and I have found many discarded wings of the above species in various parts of the garden, but on one occasion I saw one of the adults thrust a complete *rapae* down the fledgling's throat, wings and all.

Several times I saw the bird miss its prey first time and then pursue it successfully at a second attempt, but more often it returned to its perch after the first unsuccessful sally.

Up to 1978 I had only observed the odd flycatcher, but this year the birds first appeared in my garden on 20th August and were seen on almost every day until 17th September, about which time, I believe, they migrate southwards, no doubt to the satisfaction of the butterfly population.

Attractive as this little bird is, it is certainly not the 'bug-hunter's' friend.

REFERENCE

ALDRIDGE, W. (1885). A Gossip about the Wild Birds of Norwood and the Crystal Palace Area.

B. R. Stallwood (1547)

SOME OBSERVATIONS ON THE STAG BEETLE

LUCANUS CERVUS L.

At the beginning of June my son caught one male and one female stag beetle in his garden at Kingston-upon-Thames. Before he could get them to me at South Benfleet, Essex they had already mated. I put them in a cage with rotting oak wood buried in damp leaf mould and a piece of oak bark on top. The female went underground and spent the summer chewing up wood, only coming up occasionally for a short while. I presume the chewing up was done to make the wood into suitable food for the new-born grubs and I am hoping that she did lay eggs. It will however be some years before I will know if there is anything there. The male did not go underground often; he mostly sat on the bark and would 'rear up' when I opened the cage. Every day a little honey, marmalade or squashed grape was smeared on the bark and by next day it had gone. Both beetles seemed content and did not walk about looking for a way out. By the middle of August the female had stopped working and soon after she died. During the third week of August the food was left untouched, the male no longer rearing up at me. He sat very still and on the 28th August he died of 'old age'. If I do manage to rear stag beetles I intend setting them out in the woods near here where they would find plenty of rotting oak stumps.

Grete Chapman (6539)

NOTES ON THE VARIATION IN NUMBERS OF

HOLLY BLUE (CELASTRINA ARGIOLUS L.)

DURING SEASONS 1974-77 IN THE WOKINGHAM AREA

This species is widespread in well wooded areas of the Wokingham (East Berks) district.

Over the past four seasons I have noted large fluctuations in the number of adults seen, especially the partial second generations which flies in late July-mid August.

For the seasons 1974-77 the first generation appeared to be quite constant in numbers. Compared with years 1975-77 its appearance in 1974 was early—1st one was on the 4th April.

It is the partial second generation that seems to be the one that varied the most.

In the season of 1974 very few were seen—possibly due to the poor summer of that year.

The season of 1975 however was different. The second generation was far more abundant than in the year before.

It was in this year (1975) that fresh specimens of the Holly blue were seen in mid October, but not a large number. No specimens of this species were seen in September and early October. This could have

been due to the long warm summer of that year.

The summer of 1976 gave a very poor showing of summer specimens. This must have been due to the very hot dry summer of that year.

This year (1977) there was quite a contrast to 1976 both in weather terms and the numbers of Holly blues seen. I have never seen so many as I saw this year. All the places I visited this summer in August the Holly blue was abundant. It must have been an ideal year for it. In spite of a very mild autumn there does not seem to be a 3rd generation this year.

From the above it can be seen that even a common well-established species such as the Holly blue can be affected quite considerably by changes in weather conditions. This species is well suited to the average British summer such as those of 1977 but any extreme either way such as those in 1974 and 1976 can make the species uncommon compared to a normal year.

The effect of the weather on our insects is of great importance not so much for the Holly blue but for rare species with small colonies when a few "bad" years can make a difference between life and death for the colonies. For colonies already decimated by human activity i.e. development; agriculture and sometimes collecting, the effect of the weather is important. With a climate so notoriously variable as that of Britain, good years do not have a habit of following each other.

David Rees (5510J)

OBSERVATIONS ON SOME LEPIDOPTERA

IN SARDINIA — JUNE 1976

As a change from spending my holidays in Alpine regions of Central Europe, my wife and I decided to take our two young daughters on a holiday in Sardinia during the last two weeks of June in 1976. This exotic choice arose out of a chance discovery of a "bargain" package holiday deal, which was being offered by one of the larger holiday tour operators during the summer of 1976 as a kind of promotional exercise to lure families to spend their holidays in a recently built hotel on the north coast of the island and lying approximately two km east of Castelsardo. Since the terms offered for young children were particularly attractive from an economic standpoint, we agreed that such an opportunity should not be allowed to pass. My wife did wonder whether such a visit would provide me with as much entomological interest as we had found elsewhere in Europe, and I assured her that Sardinia in fact harbours a surprising number of endemic species of lepidoptera and other insects!

We arrived at our hotel late in the afternoon of 13th June and it was not until the following morning that I was able to take my bearings and discover the extent of the local terrain. The hotel consisted of a

main building and groups of chalets, which provided individual living accommodation close by, and the whole complex was built on staggered levels of a steep coastal area above a small inlet cove, which was approached by a steep, winding path and rough steps. At the other end of the cove a rough track swung sharply upward towards a promontory of rocks and then levelled out below an extended area of undercliff from where the track continued for two or three kms to a small village lying to the west. There was no track or path to the west of the hotel area, and I discovered that the western littoral area of land consisted of steep banks with intermittent falls of rocks, which eventually reached the sea. This western area was difficult to clamber over because of the thick carpet of garigue or "rock heath" vegetation, which I soon found to my cost was so dense as to be at times impenetrable. In sharp contrast the littoral area lying to the east of the little cove and the rock promontory was flat with signs of having been under some form of cultivation in the past, but was now abandoned to the elements and was rapidly reverting back to garigue vegetation. In this respect the predominant plant life was sea spurge (*Euphorbia paralias*), which gave the land an attractive blue-greenish carpet appearance before the shelving rocks reached the sea. This area of uncultivated land was easily approached from the coastal path, which bordered it with an intervening rough hedge of lentisc bushes (*Pistacia lentiscus*) showing visible signs of disintegrating due to their age and the constant onslaught of dry northerly winds from the sea. On the other side of the coastal path lay a further stretch of old cultivated land, which showed signs of more recent activity in so far as there were visible signs of cereal crops still growing, although it was hard to say as to whether such crops were capable of being harvested! Behind such cultivated area the land rose steeply through scrub consisting largely of cistus to a higher plateau level, where cereal crop cultivation was in full evidence. This rocky scrub area was the original cliff escarpment left behind after years of silt deposits around the northern coast of the Island. The rocks and cliffs were granite with a pleasant pinkish colour which in turn provided the soil area with a distinct red colour.

Apart from one excursion into the mountainous area in the centre of the Island my observations were confined to the coastal regions lying both to the east and west of the hotel, an area little more than 3 kms square, and for the purposes of this article these are set out under the heading of each particular species encountered.

Hyles dahlia Geyer

This species is a local hawk-moth, which I have since discovered is almost entirely confined to the islands of Corsica, Sardinia and Sicily. A few records exist of this attractive species as having been found in Majorca and Elba. I did not in fact encounter this species until the afternoon of the last full day of our holiday, when I was strolling back

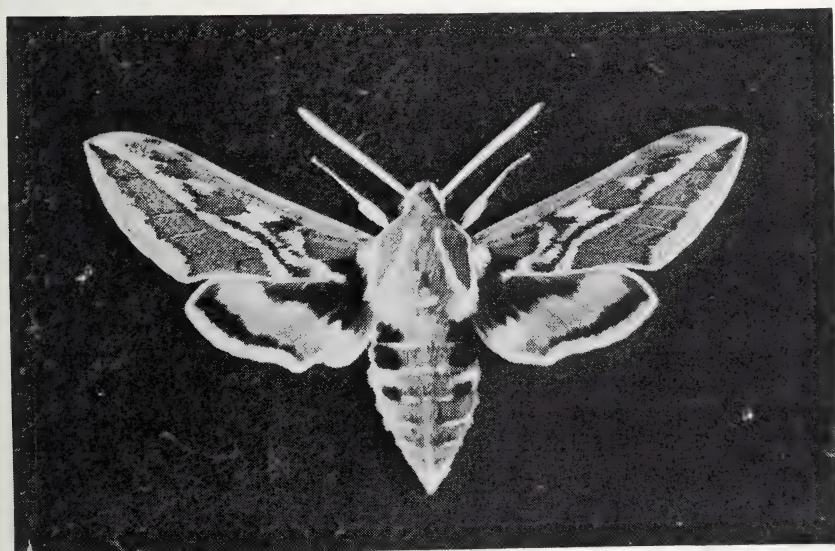
to the hotel through the clumps of sea spurge beyond the rock promontory on the eastern side of the cove. I was idly looking down on some terminal flower bracts on some of the smaller plants when I suddenly spotted a tiny black larva with a distinctive thread like "horn", which appeared to be lying motionless along an upper leaf. I immediately bent down to examine my discovery, whereupon I then noticed two opaque green, oval shaped ova also attached to the upper side of an adjoining leaf. There was little doubt in my mind that I had stumbled upon a species of hawk-moth which I assumed was the Spurge (*H. euphorbiae*). Since I was naturally curious to see whether I could find more larvae and ova, I decided to spend a little longer in this uncultivated area before rejoining my family at the hotel, and since I had my camera at the ready, I thought this a very good opportunity to put this to the test! Within minutes of my first discovery I soon found two larvae in their second and third instars, which were also browsing amongst terminal leaves and flower bracts on smaller clumps of sea spurge. The general appearance and markings of these larvae appeared to correspond with those of the Spurge hawk, so far as I could remember, except that instead of displaying large red spots in each segment of the body, there were two large irregular creamy white spots lying within a black velvet patch in the upper ventral part of each segment. In other respects the general colouration was black with many minute white speckled spots all over the upper area of the segments. There was, however, a distinctive orange dorsal stripe along the full length of the body and a yellowish ventral stripe containing deepened orange patches in each segment on each side of the body. The underside area appeared to be universally greenish with small irregular white spots of similar character as those displayed on the upper parts of the body. The prolegs were universally orange and the forelegs were pink. The horn on the anal segment was also orange for approximately two-thirds of its length and the remainder was black. However, as a striking contrast, the head and a thoracic shield on the upper side of the first segment below the head were deep coral pink. Despite such a striking appearance, the larvae blended well with their habitat, and only the pink head and thoracic shield appeared to be at odds with the general colouration of the vegetation.

Having searched amongst the smaller spurge plants for fifteen minutes or so and successfully within that time having collected no less than six larvae as well as three ova, I decided to spend a few more minutes inspecting some of the taller plants, which were growing just behind the rocks, where the alluvial soil appeared to have a deeper structure, and within this belt of soil many plants had reached the height of a metre or so and were growing as distinctive bushes, I had scarcely turned my attention to these larger plants, when I discovered two full grown larvae in their fifth instar browsing together near the top of a branch, having completely devoured most of the upper foliage. The larvae were

entirely exposed to the sun, which did not appear to cause them any concern! Their length was approximately ten cms with a body thickness of approximately 2 cms. The markings and colouration were generally the same as described before, although the area of the belly was universally pale cream with a slight translucent greenish shade present and



Fifth instar larva of *H. dahlia* from Castelsardo, Sardinia



Adult *H. dahlia* reared from larva found at Castelsardo, Sardinia

small irregular white spots as earlier mentioned. I duly collected these handsome prizes having first taken a short series of photographs, which presented no difficulties as the larvae made no effort to move away.

The following morning before leaving the hotel, I decided to make one final foray across the cove in order to collect a few more young larvae and ova in the hope of transporting them home for breeding purposes. This second visit proved to be very fruitful and in the space of half an hour I had collected another dozen or so young larvae all in their second or third instar. In order to see whether this species favoured other varieties of spurge, I made a brief search further inland towards the scrub area around the undercliff, and soon found four fully grown larvae happily feeding on *Euphorbia characias*, which is a much larger species of spurge and is often found growing around coastal regions in the Mediterranean. It is therefore, quite probably that this species of hawk moth will feed readily on other species of spurge, wherever such are available.

Upon our return to this country I found that my livestock was still healthy and my only problem was finding out whether they would accept any alternative food plants. I was able to obtain from a local source some Wood spurge (*E. amygdaloides*) and this was duly offered as a substitute and was immediately devoured in the space of a few hours! I soon realised that I would be unable to obtain sufficient supply of this species for such voracious creatures, and in desperation I started to offer some of the younger larvae Rose bay willowherb (*Epilobium angustifolium*) and to my surprise this substitute was not entirely spurned. All larvae in fact devoured this substitute, although it cannot be said that it was eaten with such alacrity as when sea and Wood spurge had been offered.

Because the weather was particularly warm after our return on 27th June, all larvae reached their final instar within ten to fourteen days. Thereafter pupation occurred rapidly and by the first week of August all but three larvae which died had pupated safely. The larvae made no attempt to burrow into damp peat which was provided for that purpose, as they appeared content merely to construct rough cocoons on the surface with the aid of a few Willowherb leaves as additional cover.

The imagines began emerging on 17th August and continued to do so intermittently until the third week in September. It was not in fact until emergence occurred that I realised that this species was not *H. euphorbiae* and I am grateful to Robert Goodden for his assistance towards identification. The notable features of this species are perhaps the distinct olive and grey markings on the forewings, which I did find to be both variable in density and colour. The hindwings display a beautiful deep rose or madder pink central area with a white basal patch. The rest of the basal area is black. There is also a sub-marginal black

band present on the hind wings and an adjoining outer marginal band, which is pinkish grey. The head and thorax were clothed with olive hairs with one distinctive feature which is not usually apparent amongst *H. euphorbiae* imagines—the shoulder lappets on each side of the thorax were bordered with white hairs, providing the insect with an attractive contrast. The antennae were universally filiform in structure and were generally whitish along the upper sides with a slightly greyish underside area. The legs were also clothed with whitish hairs with just the slightest touch of olive. The abdomen was universally clothed with olive hairs on the upper dorsal region with three distinctive patches of black hairs on the upper ventral surfaces of the first three abdominal segments. The last pair of black patches furthest away from the thorax often were preceded by a smaller area of whitish hairs. The undersides of both the fore and hind wings were generally pinkish grey with fine mottled markings, which provided a surprising contrast to the handsome markings and colouration on the upper sides. The underside of the abdomen and thorax was also pinkish grey. Although I have attempted to describe the striking beauty of this hawk moth with as much concise detail as I feel prudent for this article, the real beauty of this insect particularly when fresh emerged, has to be seen so as to be appreciated.

Whilst the summer weather remained dry and hot, I made several attempts at achieving a successful pairing of housing up to four imagines of different sexes together in my children's "Wendy House" (an ideal confined area for the pairing of Saturniids, so long as I obtained the prior approval from the children!). Unfortunately, my efforts were unsuccessful—probably largely due to my inability to obtain suitable flora for nectar feeding at a time when most of the countryside and my garden were showing the drastic effects of drought. Artificial methods of introducing diluted honey did not appear to interest these insects, and even the added stimulation of a potted *E. characias* plant placed inside this wooden structure, also did not produce any confirmed results. I did find however, two ova had been laid at the base of one shoot in the pot which were only discovered on a chance inspection a few days after the last female had died. Both ova eventually collapsed, and were certainly infertile. Despite my own failure, with advance preparation and perhaps additional space available for the moths to assemble for pairing, I would have achieved successful results, so long as temperature and possibly humidity were reasonably high. In any event this is certainly a species worthwhile breeding, if any member is fortunate enough to obtain livestock.

Papilio machaon gorganus Fruhst.

This species was certainly not difficult to find, and the imagines were most frequently on the wing between the hours of 11.00 a.m. and 3.00 p.m. Although the general colour and markings always appeared

constant, I was particularly surprised to observe that the average wing span, in particular that of the female specimens, was noticeably greater than their Continental counterparts in Central Europe. In view of the time of my visit I was fairly certain that all imagines sighted were summer second brood insects. Although I have not verified the fact, I imagine that this species produces at least three broods a year with at times a partial fourth brood.

Larvae in all instars as well as ova were to be found on clumps of fennel wherever this plant was found to exist on wasteland. Within the first few days of our arrival I had collected as many as two dozen young larvae in various instars, and I successfully bred these on the veranda area outside our chalet room. In fact I contained these voracious eaters inside a collapsible hanging net cage in which large sprays of fennel were kept immersed in a tumbler of water around which the muslin net base was tightly tied. This cage was suspended from a hook, which I conveniently found close to the veranda door.

During one very hot, sunny afternoon I witnessed on some wasteland close to the front of the hotel an example of most intriguing insect behaviour—a large female Swallowtail suddenly flew across my path and upon reaching a large clump of fennel, lying but a few metres away from me, she appeared to break her flight as if in mid-air and immediately started to hover within a few cms above the terminal feathery axils for a few seconds. Then without warning she suddenly swooped down and, without landing to support herself, she curved the posterior of her abdomen between two branched segments and with deliberate care deposited one yellowish ovum. As soon as this act was done, the Swallowtail rose quickly into the air and with a sudden, jerky movement she deflected her position, whereupon she immediately started to hover over a new section of fennel. Within a few further seconds she repeated the ovipositing action and then re-commenced hovering a few cms away. This behaviour continued for three or four minutes by which time the Swallowtail had laid half a dozen or so ova, and then as if suddenly disturbed, she flew away in a fast and determined manner, only to re-appear seconds later and re-commence the whole process again. At no time did the Swallowtail appear to lay more than six ova between the intervals when she darted away for a few seconds at a time. I remained motionless throughout this exercise, and so far as I was aware, there was no immediate cause for alarm close at hand to justify these nervous break-aways from egg-laying. I can only, therefore, conclude that this behaviour was entirely instinctive and was carried out as a kind of precautionary measure so as to elude any intruders. Eventually after some ten minutes within which time twenty or so ova had been laid throughout the whole area of fennel, the Swallowtail finally decided to end her activity, whereupon she disappeared up the hill and out of sight. A few days later I saw another female Swallowtail carrying out the same exercise elsewhere close to the cove, and on yet

another occasion whilst my wife was with me we were amused to watch another female persistently hovering over a small tamarisk bush lying close to the sandy fore-shore of the cove in the mistaken belief that she had found a clump of fennel! Strangely enough that particular Swallowtail continued her behaviour for quite some time and appeared almost reluctant to fly away. Why a mistake of such an elementary nature should have occurred, has always puzzled me—I can only presume that owing to the superficial likeness in appearance between the small tamarisk bush and a large fennel clump, even a Swallowtail can be forgiven for such a mistake in her burning desire to relieve herself of her burden!

My captive stock was transported back home at the end of our holiday by which time such larvae which had not already pupated, were within a few days of doing so. In fact all remaining larvae did pupate safely within seven days of our return and imagines began to emerge six weeks later in mid-August. They were all consistently large and one female was measured to have a full fore wing span from the apex to the base of 50 mm. This particular insect displays a deep yellow colouration on the upper sides of both fore and hind wings and may prove to be *form aurantiaca* Speyer. No pairings were obtained despite my efforts. Three pupae subsequently over-wintered and the imagines did not emerge until the following spring. These three displayed the usual and not uncommon seasonal colouration and dense markings of the first Spring brood.

Pontia daplidice L.

Strangely enough I only encountered one specimen of this species, which almost collided with me on my return to the hotel from the cove one late morning. I was, however, able to identify the butterfly with certainty due to the distinct green markings on the underside of the hind wings as well as the strong and purposeful flight manner. This species is probably more likely to be found in early spring and the late summer months, when the migratory habits of the species is more evident.

Colias crocea Geoffroy

This species was certainly abundant around the coastline and both male and female imagines were often to be seen in flight around open wasteland area wherever there was an abundance of flora. I spotted the white female *form helice* Hueb on more than one occasion, although clearly this form was not common. Most imagines were large with a full fore-wing span of 25 to 27 mm.

Gonepteryx cleopatra cleopatra L.

I was delighted to find that this species was still on the wing, since this beautiful butterfly with its distinctive orange “flushes” on the upper

sides of the fore wings is usually to be found in early spring and then again in late summer. I was surprised at the aerial agility displayed by the male even when windy conditions prevailed. This species tends to display a solitary nature and it was, therefore, rare to see more than two imagines flying together at any one time. The female was much scarcer and I only saw two throughout the whole of our holiday, one of which was caught. I was not, however, successful in obtaining any ova.

Aglais urticae ichnusa Huebner

This interesting sub-species of the small Tortoiseshell is one of the endemic species confined to both Corsica and Sardinia, and the notable feature is the absence of the black spots within the postdiscal region of the upper fore wings. I only encountered three specimens during a day's excursion into the mountainous central area of the Island lying to the south of the old provincial capital, Nuoro. These imagines flew past me at great speed, whilst I was in the midst of munching a ham roll with my wife and children—there was certainly no opportunity for me to catch any of these insects in such circumstances! However, I did notice that the deep orange colouration on both the fore and hind wings was particularly bright and this fact helped me to identify this species with certainty. No specimens were ever recorded as being sighted around our hotel on the north coast. It is probable that this species is largely confined to mountainous areas on the Island and may in fact be confined to certain altitude levels.

Vanessa cardui L.

Strangely enough I only encountered this common species during the last two days of our holiday in small numbers on wasteland behind the hotel. Since all specimens were in very good condition and appeared to be newly emerged insects, it is quite likely that they were preparing to migrate towards the mainland and were adopting this small area of land as a sort of rendezvous before setting out on their long migratory journey towards Central Europe and beyond.

Vanessa atalanta L.

Only a limited number of this species was recorded as sighted throughout my visit; but at least one or two solitary specimens were seen in flight around the cove and around the underciff areas on most days. I suspect that this species breeds throughout the Island and may produce at least three broods throughout the year.

(to be continued)

Nigel F. Gossling (5169)



Exotic Entomological Specimens

LEPIDOPTERA — COLEOPTERA — MISCELLANEOUS INSECTS

Livestock of Saturniidae, etc.

Please write for details of our lists, etc.

R. N. BAXTER

**16 BECTIVE ROAD, FOREST GATE, LONDON, E7 0DP
ENGLAND.**

For a personal and interested service

Member of the Entomological Suppliers' Association

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Othoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

Annual subscription — £6.50.

Write for specimen copy to E. H. Wild, 112 Foxearth Road, Selsdon, Croydon, Surrey, CR2 8EF enclosing 60p.

This amount will be taken into account in the first year's subscription

Q Naturalist Enterprises

69 Marksbury Avenue, Kew, Richmond, Surrey, England

Tel. 01-878 5771

WE SUPPLY LIVING AND PAPERED MATERIAL OF WORLD WIDE SPECIES

Our wish is to offer stock of fine quality
in an honest and friendly manner

HAVE YOU TRIED US

We can offer you livestock and papered specimens to suit the
young collector/breeder and rarely offered species
to the specialist at competitive prices, and of choice quality

WE ARE HAPPY TO BUY/EXCHANGE LIVESTOCK

Spring/Summer livestock/papered list issued

February of each year

Specialist list issued throughout the year

Please send for our new list

Specialist £0.70 per annum.

Send S.A.E. for sample list

BRITISH ENTOMOLOGICAL & NATURAL HISTORY SOCIETY

Illustrated Papers on British Microlepidoptera

The Society announces the publication shortly in one volume of twelve articles reprinted from the "South London" Proceedings between 1944 and 1957 with the 12 original colour plates.

These papers comprise LAMPRONIIDAE & ADELIDAE, LITH-
OCOLLETIS, and OECOPHORIDAE (3 parts) & ALLIED
FAMILIES by S. N. A. Jacobs; PSYCHIDAE, PLUTELLIDAE
and GLYPHIPTERYGIDAE & ALLIED GENERA by L. T.
Ford; CALOPTILIA and LYONETIIDAE by S. C. S. Brown;
ERIOCRANIIDAE & MICROPTERYGIDAE by J. Heath and
MOMPHA by S. Wakely. For ease of use the pages and plates
have been renumbered and are fully indexed accordingly; in addi-
tion there is a new appendix drawing attention to species belonging
to these groups which have been added or sunk. There is also a
list of species which relates names used in the text to up-to-date
nomenclature and classification.

A **limited** edition of 500 copies is being published in the Autumn
of 1978. The book will be bound in cloth. Price: £9; **£6 to
members of the Society**. Postage where applicable 60p extra.

Copies may be obtained from: Hon. Treasurer, R. F. Bretherton,
Esq., Folly Hill, Birtley Green, Bramley, Surrey.

THE AMATEUR ENTOMOLOGISTS' SOCIETY

ANNUAL EXHIBITION, 1979

SATURDAY, 15th SEPTEMBER

11 a.m. to 6 p.m.

PALM COURT, ALEXANDRA PALACE,
LONDON

MAPS on the reverse of this notice, show the location of Alexandra Palace.

ACCESSIBILITY – It is easily reached by road from the M 1, the North Circular Road and a variety of routes from Central London (7 miles). Wood Green (British Rail from Kings Cross), Turnpike Lane and Wood Green Stations (Piccadilly Line via Kings Cross) are close by. LT Bus Service (W3) runs from Finsbury Park and Wood Green to the Palace.

PARKING – Space for 2,000 vehicles on the Terrace.

ADMISSION FEE is 20p except for Exhibitors who will be admitted free.

EXHIBITORS AND DEALERS ONLY will be admitted before 11-00 a.m.

TROLLEYS – These are not provided and provision should be made for heavy loads.

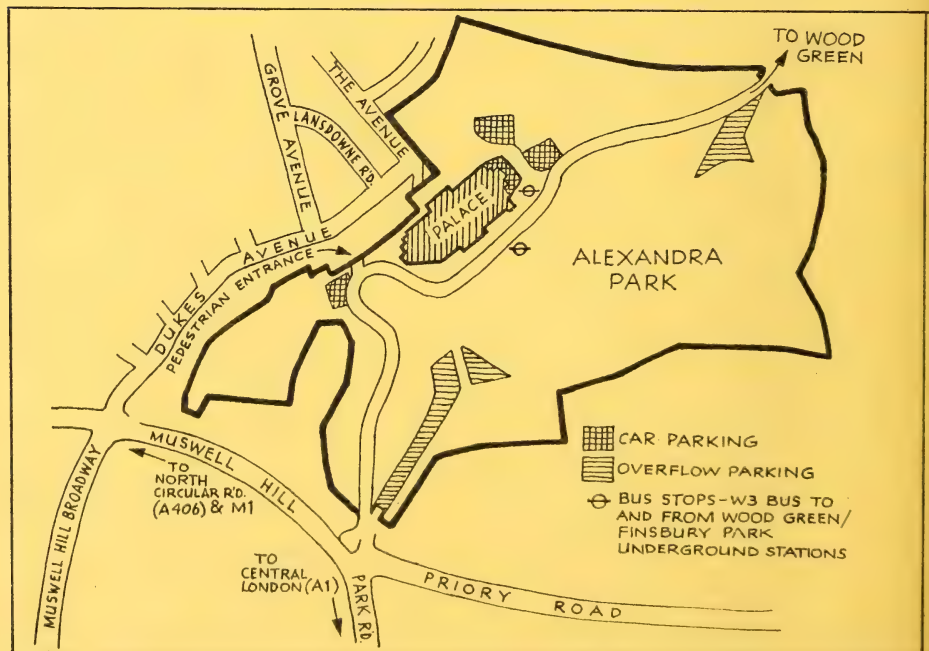
ENTOMOLOGICAL DEALERS will be in attendance.

REFRESHMENTS – Normal cafeteria service.

SURPLUS MATERIAL will be welcome for sale on behalf of the Society's funds.

SPECIAL FEATURES are being arranged.

ALL ENQUIRIES to B. F. SKINNER,
5 Rawlins Close, South Croydon, London, CR2 8JS.



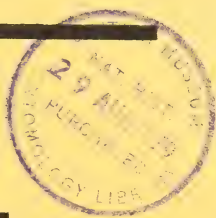
5.364

VOL. 38 NO. 324



AUGUST 1979

**THE
BULLETIN OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**



WORLD LIST ABBREVIATION:
BULL AMAT ENT SOC

EDITOR:
BRIAN GARDINER FLS FRES

The Amateur Entomologists' Society

(Founded in 1935)

President :	B. R. STALLWOOD	7 Markhall Close, Cheriton, Alresford, Hants. SO24 0QF.
Hon. General Secretary :	P. A. SOKOLOFF	4, Steep Close, Orpington, Kent. BR6 6DS.
Hon. Bulletin Editor :	B. O. C. GARDINER	c/o ARC Unit, Dept. of Zoology, Downing Street, Cambridge.
Hon. General Editor :	P. W. CRIBB	355, Hounslow Road, Hanworth, Feltham, Middx.
Hon. Treasurer :	R. A. FRY	8 Heather Close, New Haw, Weybridge, Surrey KT15 3PF.
Registrar	Mrs. B. W. KEEN	3 Woodbourne, Farnham, Surrey GU9 9EF.

where to write

Subscription renewals
(£3.00 p.a. or £2.00 under 18) :

First subscriptions, (£3.50 or £2.50
under 18), changes of address,
non-arrival of Bulletins, member-
ship applications and records :

Manuscripts, drawings and Books
for review :

Advertisers :

Exhibition matters :

General enquiries :

J.C.C.B.I. representative :

A.E.S. Conservation Group :

A.E.S. Exotic Insects Group :

A.E.S. Insect Behaviour and
Ants Study Group :

B. R. STALLWOOD, 7 Markall Close,
Cheriton, Alresford, Hants. SO24 0QF.

REGISTRAR
Address in list above

B. O. C. GARDINER,
Address in list above.

R. D. HILLIARD, 18 Golf Close,
Stanmore, Middx. HA7 2PP.
(01-954 0460)

B. F. SKINNER, 5 Rawlins Close,
South Croydon, Surrey, CR2 8JS.

P. A. SOKOLOFF,
Address in list above.

D. KEEN, 3 Woodbourne, Farnham,
Surrey, GU9 9EF.

D. LONSDALE, Forest Res. Stn.,
Alice Holt Lodge, Wrecclesham,
Farnham, Surrey, GU10 4LH.

C. J. ESCHBACHER, 38 Frith Road,
Bognor Regis, Sussex, PO21 5LL.

M. M. PARSONS, 95 Glebe Lane,
Barming, Maidstone, Kent, ME16 9BA.

The Observer's Book of CATERPILLARS

By David J. Carter

Illustrated by
Gordon Riley

This pocket guide deals with the more common species found in the British Isles and also includes some which are more scarce but of special interest. Over 200 species are described with details of food plants, distribution and life histories. The Introduction gives a general outline of caterpillar biology and notes on collecting and conservation. 226 colour illustrations and line drawings.

£1.25 net.

Frederick Warne
Warne House Vincent Lane
Dorking Surrey RH4 3FW

Official Publications Agent

L. CHRISTIE

HAS MOVED TO

**129 FRANCISCAN ROAD,
TOOTING, LONDON,
SW17 8DZ**

(Postal business only)

**Members of the Entomological
Suppliers Association.**

Advertising in the A.E.S BULLETIN

Advertisements are seen by a wide cross section of entomologists and others interested generally in natural history. Subscribers include collectors in many overseas countries as well as foreign libraries and museums. Rates are:-

Whole page £14

Half page £8

Quarter page £5

Enquiries to Advertising Secretary

(address on front cover)

FOR SALE

**Ex-BRITISH MUSEUM
INSECT CABINET**

Size 48" wide × 42" high
× 20" deep

26 drawers each about
20" × 18" × 2½"

Glass top and bottom
At present containing small
English Butterfly collection
and some tropical.

J. Shapland,
Solitude,
Rawlings Lane, Sear Green,
Beaconsfield,
Bucks. HP9 2RQ.
Tel. Chalfont St. Giles
(02407) 2975

Member
of the
Entomological
Suppliers'
Association



Worldwide Butterflies Ltd

Open to Visitors Daily 10 - 5 incl. weekends
APRIL TO OCTOBER

**BUTTERFLIES IN A STATELY HOME FLYING AND
BREEDING IN TROPICAL PALM HOUSE
AND NATURAL JUNGLE**

Collections from across the World

FREE CAR PARKS REFRESHMENTS

BOOKS SPECIMENS EQUIPMENT LIVESTOCK

Situated on A30 Sherborne - Yeovil dual carriageway

Send stamped addressed envelope for price list of
livestock, Entomological equipment, Specimens and Books

Worldwide Butterflies Ltd.

Compton House, Sherborne, Dorset. Yeovil (0935) 4608



AES

BULLETIN

No. 324

EDITORIAL

Due to postal delays it was unfortunate that some members did not receive the February Bulletin until after the Annual General Meeting. For this we apologise. In fact the Bulletin was already behind schedule and did not get published until the last day of February. Members might like to know that the Manuscript for this August issue went to our Printers in the last week of April.

This year, as already announced in our last issue, the Exhibition is to be at the earlier date of September 15th and in the larger venue of Alexandra Palace. We again hope to see old friends and fresh faces. Details of how to get there are on our cover.

Due for the need to try and get the August issue out on time, so that nobody misses the annual exhibition, but also to their not yet, mid-April, being to hand, let alone edited, the usual annual reports normally published in this quarter's issue, must be held over to November.

TO A CRICKET

Merry Cricket, twittering thing,
How I love to hear you sing!
Chirping tenant, child of mirth,
Minstrel of the poor mans hearth!
Stay, merry Cricket, stay, and be
Companion in our jollity.
Winter days are round us now,
Stormy winds and falling snow;
Pelting hail is rattling fast,
Driven by the northern blast.

* * *

Spring about the oaken floor,
Dread not pussy's murderous paw;
Dainty crumbs and fragments rare
Shall be scattered for thy fare;

* * *

Stay, then, merry Cricket, stay,
Tarry with the glad and gay;
Share our blazing fire, and be
Partner in our jollity.

Eliza Cook

GREASE

I have been an amateur entomologist now for as many as 10-15 years and in that time amassed together a considerable collection of both butterflies and moths, both British and foreign. My sources have been many; some I collect or breed, others I purchase from dealers, or from old collections.

I seem, from time to time, to have problems from 'grease'. Greasing seems to affect recent specimens, mainly moths, but occasionally it affects butterflies, and as I collect very few compared with moths, the butterflies affected are usually older specimens rather than freshly caught. In 1977 I bred a series of Lime Hawk moths, *all* of which subsequently went greasy. Continuing the same series in 1978, I have had no further trouble. One Privet Hawk from a series of about 10 went greasy. A Morpho butterfly several years old has recently gone greasy 'out of the blue', and likewise a very old Glanville Fritillary, previously perfect. Looking at my collection today, I noticed that several Buff-tip moths have gone greasy, and the bodies of a series of Peppered moths have gone translucent, although the wings are not affected. It may sound silly but I cannot say in any of these cases whether in fact the condition pre-existed or whether I merely failed to notice it, although I check regularly. Perhaps in daylight the condition is not so readily visible, and tends to show up under artificial light. Both the last two species are 1977 caught, so should have been totally dried out by now. Text books advise "watch out for grease" and suggest what may be done to get rid of it, but I fail to find it practical, nor worth the effort. What they do NOT say, and what no one seems to know, is what CAUSES it and thus how to AVOID it.

My house is a recently built terraced house with full gas warm-air central heating and there is no question of damp; if anything, the opposite. The temperature throughout is warm, probably between 60-70° F. The collection is kept partly in air-tight cabinet drawers, and partly in new store-boxes. Preservative crystals purchased from Entomologists are regularly replaced in each box. I am confident there are not mites. The collection is thus stored in the dark, under warm, dry conditions. The cabinet by the way, is against an inside wall. I find myself posing the following questions:

1. Is the warmth of the house responsible? Would it occur if the collection were placed in a cool room with the air-vent closed?
2. Is the occurrence related to the Preservative crystals? Does it aggravate the occurrence of this problem by the fact that fresh crystals are added to replace those which are gone? (I presume crystals are naphthalene or similar, I get them for the purpose from Watkins & Doncaster, Naturalists.)
3. It always seems to be males which are affected, certainly the females, even though sometimes larger and wider-bodied are not. Why?

4. Is it possible that a gland or similar is punctured when setting a specimen? (Why are they not all affected, especially if we are considering a series of identical moths from the same source and same time?)
5. Does the male moth or butterfly possess some greasy hormone or substance which the female doesn't?

I am in no way a scientist but I have considered experimenting perhaps with Lime Hawks or Buff-tips as they have shown they are prone to it, by keeping a series in different conditions to see if grease can in fact be induced, which will of course suggest the cause, and a means of avoiding it. For example, larvae of the same species fed on different foodplant, (is that a factor? Both Limes and Buff-tips feed on different foodplants; all the original Lime Hawks were bred on Lime, likewise the bred Buff-tips, but some of mine are caught specimens.). Also, groups of males and females; different storage conditions, etc. I would be very grateful for members comments and suggestions.

T. MacFadyen (6218)

Mr. David Carter of the Entomological Department of the British Museum (Natural History) has kindly replied to Mr. MacFadyen's grease query as follows.

Greasing of specimens is a universal problem of Lepidopterists and so far no completely satisfactory remedy has been found. All Lepidoptera have a certain amount of body fat and it appears to be the release of this or its combination with other chemicals which produces unsightly results.

Various theories have been put forward to explain the cause of greasing in some species, such as the use of ethyl acetate for killing or of camphor as a pest repellent in drawers. It is even possible that naphthalene crystals may be responsible for some greasing as one lepidopterist tells me that he has often noticed cases shortly after recharging drawers with this substance.

The only certain method of prevention is to remove and degrease the abdomens of all specimens before putting them in the collection. This is, of course, a lengthy and laborious procedure, but a number of collectors feel that it is worthwhile.

David J. Carter

(This subject is of considerable interest to many members and your editor would be pleased to have explanations and experiences of grease for publication in future Bulletins. Full details of methods for degreasing spoilt specimens and for its prevention by removal and stuffing of abdomens at the time of setting as were in use by Victorian Entomologists, and for which no modern substitute appears to exist are given by the Rev. Joseph Greene in his excellent book "The Insect Hunter's Companion". — Editor.)

SOME OBSERVATIONS ON LEPIDOPTERA RECORDED IN LIGHT TRAPS AND ON SUGAR PATCHES IN AUGUST AND SEPTEMBER 1977 AT BRAISHFIELD, HAMPSHIRE

Introduction

A Heath type mercury vapour moth trap has been operated, at first weekly and later daily since 26th April, 1975. Since 17th April, 1977, two such traps have been in use each day. During the period 22nd August, 1977 to 16th September, 1977 "sugar" was also set out, see accompanying sketch map (Fig. 1). The "sugar" mixture was applied to posts and trees in vertical strips from 1.5 metres to 2.5 metres approximately from the ground (thus at a height range comparable with the height range of the two moth traps). The recipe for the sugaring mixture was as follows:—

1 lb treacle; $\frac{1}{2}$ pint stale beer; 2lbs brown sugar; old blackcurrant jam.

The moths taken during the period 22nd August to 16th September, 1977 are listed later in Table 1. All were released alive.

The sugar mixture was applied for four days before the period of study. The mixture was applied about one hour before dusk and these patches were observed at 9 pm., 11 pm., and 1 am.

Observations

Some species were frequently noted on the "sugar" patches, of these the Angle Shades (*Phlogophora meticulosa*, L.) was most often noted on sugar on the group 1 trees. Only one was caught by light, and only one was recorded on the post near Trap 1. It would appear that this species is more abundant in the group of trees and less so near the garden area where the few species taken seemed equally attracted to the light and the sugar.

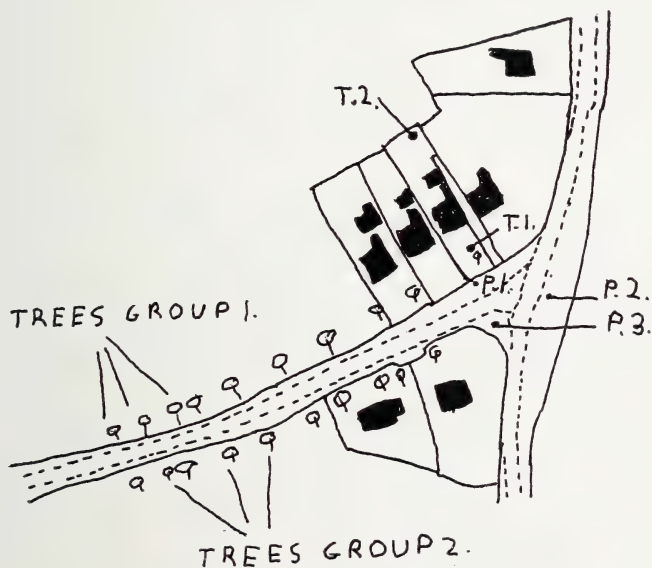
Red Underwing (*Catocala nupta*, L.). Only one of these was caught in a light trap, all the others were caught on the two groups of trees (Groups 1-2). This species was strongly attracted to sugar and seems to inhabit the tree area and not the lower vegetation. It would appear that they do not stray far from the trees, possibly they also remain high, as they fly high as noted later.

Copper Underwing (*Amphipyra pyramidea*, L.). A few were caught in both light traps and about the same number caught on sugaring posts nearby. This may show that they are equally attracted to sugar and light. However a greater number, about fifteen times as many, were caught on the trees (Groups 1 and 2) which may indicate that these also remain mostly in the wooded area.

The Mouse Moth (*Amphipyra tragopoginis*, Clerck). Although most were caught in light traps (more being taken in traps near the hedge) a few were caught on sugar, on posts 1, 2 and 3, and nearby. None were

FIG. 1

SKETCH MAP SHOWING POSITIONS OF
LIGHT TRAPS & SUGAR PATCHES
LOCATION LOWER STREET BRAISHFIELD



T.1. = Light trap 1, ground level.
T.2. = Light trap 2, 1.34 metres
above ground.
P.1.
P.2. = Sugaring posts.
P.3.

Scale 1:2500 or 25.344 inches
to 1. mile.

Map reference 366 254
SHEET 32 OS.

GROUP 1 Species noted on Sugar and in Light Traps

Scientific name Common English Name

Scientific name	Light Trap 1		Light Trap 2		Trees Group 1		Trees Group 2		Post 1		Post 2		Post 3	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
<i>Leucania pallens</i> L.	51	11	67	14	2	2								
<i>Amphipyra tragopoginis</i> Clerck	78	17	202	21					13	9	2	1	9	6
<i>Luperina testacea</i> Schiff	1592	24	968	25									1	1
<i>Noctua pronuba</i> L.	266	26	263	21	10	6	8	5						
<i>Apamea secalis</i> L.	38	8	78	11			2	1			1	1	1	1
<i>Euschesis comes</i> Hubn	252	26	283	24					2	1				
<i>Amathes baja</i> Schiff	42	17	55	13	7	6	3	3	7	6	4	3	14	12
<i>Apamea monolypha</i> Hufn	2	1	5	1	1	1								
<i>Amphipyra pyramidea</i> L.	8	4	4	4	104	22	109	19	5	3			3	3
<i>Catocala nupta</i> L.	1	1			9	4	10	7						
<i>Phlogophora meticulosa</i> L.			1	1	4	3	1	1					1	1

A = Total Number of Specimens taken.

B = Number of occasions on which a species was taken.

caught on the two groups of trees. This species may remain near hedge-rows rather than in wooded areas.

Large Yellow Underwing (*Noctua pronuba*, L.). These were taken in large, roughly equal numbers in each light trap. Some were found on sugar in the wooded area, but only one near the traps. These certainly seem more attracted to light, but where the light could not be seen, they were attracted to the sugar to some extent. From results on sugar patches it would appear that more might be found in the wooded area.

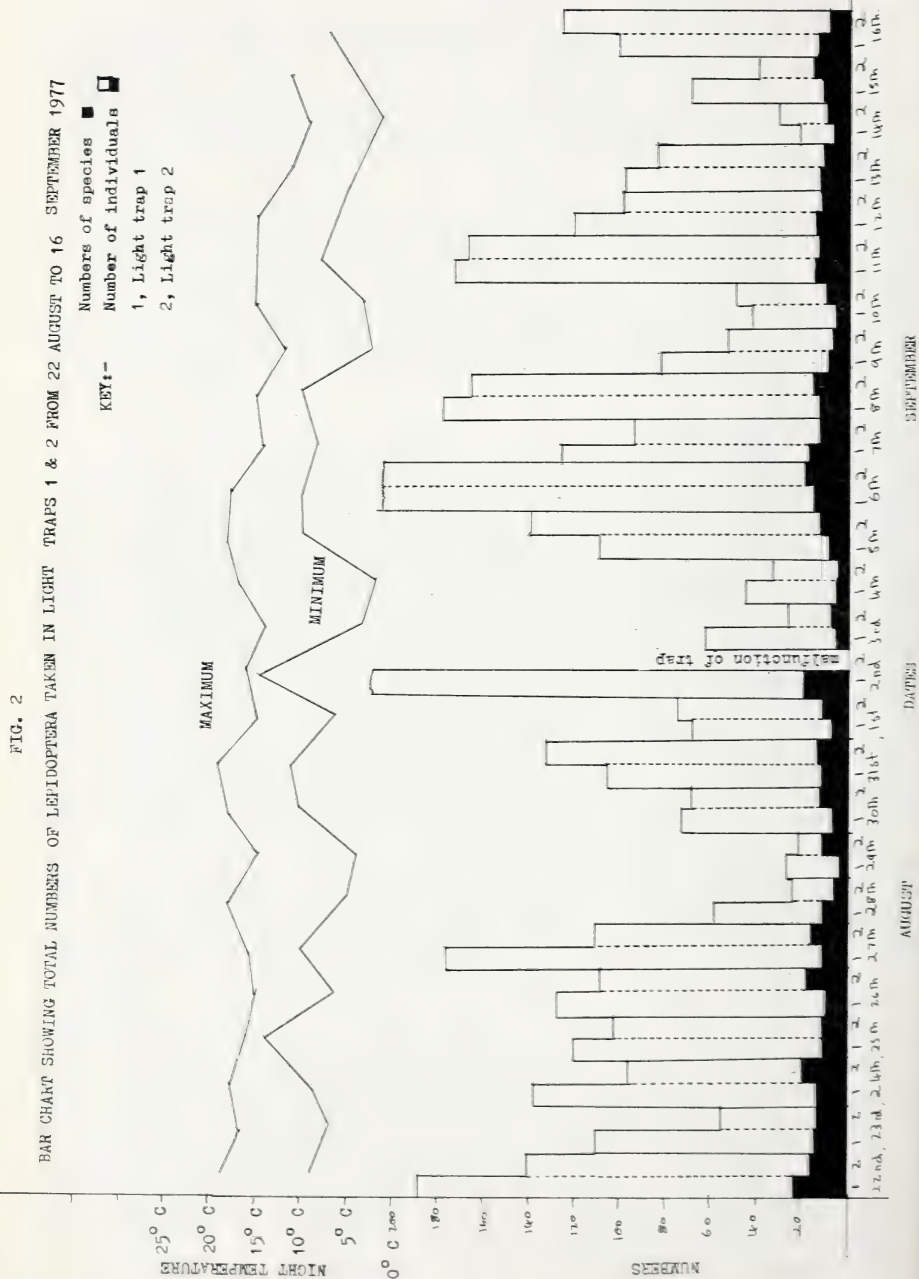
Dotted Clay (*Amathes baja*, Schiff). Again similar numbers were taken in both traps. They were also noted on all sugar patches. One interesting point noted was that on one post (P.3) near Trap 1, although not nearly as many moths were caught as in the traps, they appeared about the same number of times. This could be because the moths are held in the light trap until released but can fly from the sugar and many are missed.

Note to Light Traps

The moths caught were usually released at dusk in long undergrowth away from the site of the traps. However, strong fliers such as Red and Large Yellow Underwings were often released in the morning to prevent damage. Two interesting things were noticed; although only one Red Underwing was caught in the period 16th September, quite a few more were recorded later in the traps. When they were released in the morning, they mostly flew up to about 20 ft. in the air, circled once usually in a clockwise direction and then flew straight back in a South-West direction to the trees (Groups 1 and 2) where they were often found so readily on sugar. Does this show a homing instinct? On the other hand, the Yellow Underwings often flew strongly but in no particular direction and many only flew about 10 ft. to the nearest bush or hedge. The Copper Underwings showed no tendency to fly at this time.

From the bar chart (Fig. 2) it can be seen that the number of moths caught in both traps is related to the temperature (especially the minimum temperature), on that night. Thus when the minimum temperature at night is high, a large number of moths were caught, but the numbers caught were markedly less when the minimum temperature was less than 0°C. On most occasions the numbers in both traps were roughly the same. However on five occasions (marked X) the number in trap 2 dropped, in some cases to almost half the catch in trap 1. Each time a strong North-East wind was blowing and this could have affected trap 2 as it was placed higher, and had a hedge below it on the North and East sides. It is possible that some species of moths fly lower on very windy nights, or that in this case remained in the shelter of the hedge which was below the trap.

In reference to Table 1 in Group 2, species such as *Xanthorrhoe*



fluctuata, *Agrotis puta*, *Caradrina blanda* were caught in high numbers in both traps. In contrast, in Group 3, species such as *Hepialus sylvina* and *Plusia gamma* were caught in far greater numbers in trap 1. Of these species, *Plusia gamma* is known to visit honeysuckle and these plants were growing in this part of the garden. The only moth which was caught in far greater numbers on trap 2 was *Opisthograptis luteolata*. The larvae of this moth feed on Hawthorn and Sloe, and the hedge situated near the trap was also of Hawthorn and Sloe.

Scientific Name	Common English Name	Light Trap 1		Light Trap 2	
		A	B	A	B
Group 2. Species noted in Light Traps only					
<i>Xanthorhoe fluctuata</i> L.	Garden carpet	32	11	42	14
<i>Cleora rhomboidaria</i> Schiff.	Willow beauty	9	6	10	4
<i>Eupithecia vulgata</i> Haw.	Common pug	5	2	4	2
<i>Euxoa nigricans</i> L.	Garden dart	3	1	3	1
<i>Pterotroma palpina</i> Clerck	Pale prominent	1	1	1	1
<i>Mamestra brassicae</i> L.	The cabbage	1	1	2	1
<i>Agrotos puta</i> Hubn.	Shuttle shaped dart	56	20	43	12
<i>Scopula lactata</i> Haw.	Cream wave	1	1	2	1
<i>Horisme vitalbata</i> Schiff.	Small waved umber	2	2	2	1
<i>Cosymbia annulata</i> Schälze	Mocha	1	1	1	1
<i>Gortyna micacea</i> Esp.	Rosy rustic	4	3	5	5
<i>Pleuroptya ruralis</i> Scop.	Mother of pearl	3	3	4	3
<i>Caradrina blanda</i> Schiff.	The Rustic	76	15	87	15
<i>Amathes c-nigrum</i> L.	Setaceous hebrew character	17	9	13	6
<i>Apatele aceris</i> L.	Sycamore	1	1	2	2
<i>Plusia chrysitis</i> L.	Burnished brass	1	1	1	1

Scientific Name	Common English Name	Light Trap 1		Light Trap 2	
		A	B	A	B
Group 3. Species noted only or mainly in Trap 1					
<i>Eupithecia centaureata</i> Schiff	Lime speck pug	1	1		
<i>Epirrhoe alternata</i> Mull.	Common carpet	1	1		
<i>Unca triplasia</i> L.	Spectacle	3	1		
<i>Lyncometra ocellata</i> L.	Purple bar	1	1		
<i>Euphyia bilineata</i> L.	Yellow shell	2	2		
<i>Arctia caja</i> L.	Garden tiger	4	3		
<i>Colostygia pectinataria</i> Knoch	Green carpet	1	1		
<i>Selenia bilunaria</i> Esp.	Early thorn	1	1		
<i>Deilinia pusaria</i> L.	Common white wave	3	2	1	1
<i>Omphaloselis lunosa</i> Haw.	Luna underwing	27	8	17	4
<i>Hepialus sylvina</i> L.	Orange swift	20	11	8	5
<i>Phragmatobia fuliginosa</i> L.	Ruby tiger	2	2		
<i>Evergestis forficalis</i> L.	Garden pebble	8	6	2	2
<i>Plusia gamma</i> L.	Silver Y	137	22	48	10
<i>Eremobia ochroleuca</i> Schiff.	Dusty fallow	11	5	5	3
<i>Caradrina clavipalpis</i> Scop.	Pale mottled willow	5	4	2	2
<i>Anaitis plagiata</i> L.	Treble bar	3	3	1	1
<i>Thalophila matura</i> Hufn.	Straw underwing	5	4	1	1

Scientific Name	Common English Name	Light Trap 1		Light Trap 2	
		A	B	A	B
Group 4. Species noted only or mainly in Trap 2					
<i>Cryphia perla</i> Schiff.	Marbled beauty			1	1
<i>Hypsoxygia costalis</i> Fab.	Gold fringe			1	1
<i>Xanthorhoe spadicearia</i> Schiff	Red twin spot carpet			1	1
<i>Hadena rivularis</i> Fab.	Campion			1	1
<i>Cosymbia punctaria</i> L.	Maidens blush			1	1
<i>Scoliopteryx libatrix</i> L.	Herald			1	1
<i>Tholera popularis</i> Fab.	Feathered gothic			2	2
<i>Lampra fimbriata</i> Schieber	Broad bordered yellow underwing			3	3
<i>Dysstroma citrata</i> L.	Dark marbled carpet			1	1
<i>D'ataraxia oleracea</i> L.	Bright line brown eye			1	1
<i>Plusia jota</i> L.	Golden Y			3	1
<i>Euschesis janthina</i> Schiff.	Lesser broad border			3	2
<i>Scopula imitarra</i> Hubn.	Small blood vein			1	1
<i>Drepana binaria</i> Hufn.	Oak hook tip			1	1
<i>Apatele tridens</i> Schiff.	Dark dagger			1	1
<i>Lophopteryx</i> L.	Coxcomb prominent			1	1
<i>Apamea unanimes</i> Hubn.	Small clouded brindle			1	1
<i>Agrotis segetum</i> Schiff.	Turnip			1	1
<i>Semiothisa alternata</i> Schiff.	Sharp angled peacock			1	1
<i>Agrotis exclamationis</i> L.	Heart and Dart			3	1
<i>Melanchra persicariae</i> L.	Dot			1	1
<i>Amathes sexstrigata</i> Haw.	Six striped rustic			1	1
<i>Larentia clavaria</i> Haw.	Mallow			1	1
<i>Hydraecta oculatea</i> L.	Ear	1	1	4	4
<i>Anaitis efformata</i> Guen.	Lesser treble bar	1	1	3	2
<i>Calothyssanis amata</i> L.	Blood vein	1	1	5	5
<i>Cilix glaucata</i> Scop.	Chinese character	2	2	4	3
<i>Abraxas grossulariata</i> L.	Magpie	1	1	3	3
<i>Ochropleura plecta</i> L.	Flame shoulder	1	1	4	2
<i>Ligdia adustata</i> Schiff.	Scorched carpet	1	1	3	2
<i>Menophra abruptaria</i> Thunb.	Waved umber	2	2	5	3
<i>Opisthograptis luteolata</i> L.	Brimstone	6	5	18	13
<i>Apatele aceris</i> L.	Sycamore	2	1	5	1
<i>Deuteronomous alniaria</i> L.	Canary-shouldered thorn	3	3	6	5

Clearly for the less frequent species, the final species list depends very much on the trap site.

Note—The Copper Underwing, *Amphipyra pyramidea*, L. and the Drab Copper Underwing *Amphipyra berbera* Rungs have not been separated here. All have been included under Copper Underwing *Amphipyra pyramidea*.

Paul Hatcher (6232J)

THE MIDLANDS ENTOMOLOGICAL FAIR AND EXHIBITION

This first-ever Midlands butterfly show proved an important and memorable event, taking place in the elegant Charnwood Room of Leicester Centre Hotel, on Saturday, March 10th, 1979. Dealers and exhibitors arrived at 8.00 a.m. to set up their tables and the exhibition officially opened at 10.00 a.m. sharp.

In spite of wintry weather, over 750 enthusiastic visitors flocked there from many parts of the United Kingdom to enjoy a very cordial atmosphere, and a wide range of entomological interests. Well-known dealers from the Midlands, the London area, and the South-West all reported brisk trading. Lively appreciation was also shown towards the other exhibits which provided a well-balanced blend of national and local interest. The British Butterfly Conservation Society were conspicuously placed right near the entrance (and the refreshments!), we were enthralled by a Death's-Head Hawk livestock spectacle which was further enhanced by slides; the Leicester Lepidoptera Recording Scheme demonstrated their progress and discussed their work, and a particularly admirable natural history display was contributed by children of the nearby St. Catherine's Primary School. The only drawback about the refreshments was that seats on which to relax and get duly refreshed did seem rather hard to find!

The general concensus was that the overall success and popularity of the occasion far exceeded expectations. So a repeat Entomological Fair in Leicester next year seems now assured, possibly on a larger scale, and possibly several weeks later in the season in order to allow more scope of livestock display. May our own Bulletin not again fail to advertise the event in good time, please!

Considering that we periodically discuss holding additional AES. exhibitions in large cities other than London, I think we all ought to feel encouraged by the triumph of this privately-organised venture in Leicester. Moreover, the Midlands Region is favoured by convenient and quick road and rail access from all directions, and, in particular, offers very welcome opportunities for southerners and northerners to meet in a central area not too distant for most people to make a day or weekend trip.

Brian Wurzell (3718)

BOOK REVIEWS

Windowsill Ecology; controlling indoor plant pests with beneficial insects by William H. Jordan. pp. 229; illustrated. 8vo. Rodale Press, Emmaus, Pennsylvania. 1977. Price £5.25 (\$8.95).

The superficially intriguing promise suggested by the title is soon dampened as one finds oneself once again amidst a surfeit of jarring americanisms. The introduction to biological control, though clear, is somewhat simplified and follows the subjective school of American

ecologists. The "keys", if such a term is applicable to a monochotomous series of long descriptive paragraphs, enable one to identify eight main pest groups — whiteflies, mealybugs, armoured scales and so on. The same treatment is given for predators — lacewings, ladybirds, syrphids and mites. Fortunately the "keys" are supplemented by longer accounts of the biology and life-histories, rather loose in style and lurid in description: "lacewings... attack with a flourish: they seize their victims and lift them, squirming and kicking, high off the plant so that the desperate prey can't grab the surface and pull free." Parasites are given the same treatment. The author then gives fairly comprehensive advice on the methods and practice of Biological control for each specific pest group, much of which is culled from work done (mostly in Europe) on horticultural and greenhouse crops.

On balance this is not a book for the entomologist to rush out and buy; I have no doubt that they, and certainly house-plant lovers, would find it interesting, but feel it's usefulness, certainly this side of the atlantic, is somewhat limited.

CJG

A Dipterist's Handbook (The Amateur Entomologist, Vol. 15). Editors: Alan Stubbs & Peter Chandler. pp. ix; 255. Illustrated. The Amateur Entomologists' Society, Hanworth, Middx., 1978. Price £6.00.

Before I start enthusing over this remarkable little book, let me first give an outline of its contents.

Preface and Introduction (well worth reading), pp. v-ix. Collecting and Recording, pp. 1-37 (illus.). The Immature Stages of Flies, pp. 38-64 (84 line drawings of larvae, etc.). Some Microhabitats, pp. 65-92. Major Habitats, pp. 93-141. Association with other Animals and Micro-organisms, pp. 194-198. Associations with Plants, pp. 199-236. Behaviour and Adaptation, pp. 237-249 (illus.). The Fly in Time, pp. 250-255.

No fewer than 26 authors are listed as having contributed to the work — a fine example of combined operations. Warmest thanks are due to every one of them, as well as to the joint editors and the general editor, Peter Cribb, for the splendid job of planning, organizing and supervising (as well as contributing) which they have performed.

"The Handbook is prepared as a companion volume," we are told (Intro., p. vii), to that "superb introduction to flies" by C. N. Colyer and C. O. Hammond, *Flies of the British Isles*. "A strong feature of this Handbook is its emphasis on describing the fauna of different habitat types and the associations of flies with other animals and plants... A great deal of published and unpublished information has been drawn together and much of the material has never been available in this form before; much original work is included" (Pref., p. v).

The ecological emphasis of this book is what appeals to me — in fact I found it so fascinating that having once started to read it I could

scarcely put it down. It treats of flies as *living creatures* in a *living environment* — and very much a part of it.

Take, as an example of the treatment, the subdivisions of Chapter 3, entitled "Some Micro-Habitats" (the editors feel that this was not an ideal heading, but let that pass; it is beside the point anyway). First we have "Dead Wood and Sap Runs", including standing timber, fallen timber, and sap runs, with a short note on flowers, etc., and paragraphs on collecting larvae and on rearing techniques; as usual throughout this part of the volume, the section concludes with a short list of 'further reading' and an Appendix comprising a detailed annotated list of Diptera that breed in this particular habitat — over 2 pages in small type. Next comes a section on "Dung", with an over 3-page Appendix of breeding species; this is followed by a section on "Carrion", with an interesting account of faunal succession on carrion, as well as a couple of drawings illustrating apparatus for trapping and rearing flies on this substrate. There follows a section on "Mud", subdivided into "Sub-aquatic Mud", 'Where to find Good Mud' (schoolboys please note), 'How to Find, to Collect and Rear Fly Larvae from Mud', and 'Collecting Adult Flies', and a very wise 'Word of Warning' as a tail-piece. The final section of the chapter, dealing with "Water", is subdivided into 'Collecting Adults', 'Collecting Immatures', 'Sorting Samples', 'Rearing Larvae', 'Rearing Pupae', and 'Seasonal Collecting', with a most informative Appendix on 'Diptera with Aquatic Larvae'.

If your appetite is not whetted by this skeleton sample from only 27 pages out of this exciting book — and the good things continue in similar vein through at least 145 more pages — you must be unimpressible indeed. This must be one of the best things, if not THE best thing, that the AES has yet published — and I am not a Dipterist. It seems to me to excel even the Hymenopterist's and Coleopterist's Handbooks, good as those were. The amount of biological information that has been squeezed into its 255 pages is phenomenal — almost encyclopaedic. What is more, it is exceedingly readable.

This is a book that every serious-minded entomologist, or even general naturalist, should read, if only for his own education. And it is an education to read it. If you have never taken a serious interest in any of the 'other orders', just get your nose into this superb *Dipterist's Handbook*: it will open your eyes to an entirely new world.

H. K. AIRY SHAW (545)

Record of My Life Work in Entomology by C. R. Osten Sacken. A facsimile reprint of the original published between 1903 and 1904 with an introduction chapter by K. G. V. Smith. 253 pp. and 4 plates. Published by E. W. Classey Ltd. Price £7.50.

Dipterology is experiencing a resurgence and the recent publication of our own Dipterist's Handbook will perhaps increase the interest in this branch of entomology. The decision of E. W. Classey Ltd. to produce

this facsimile of C. R. Osten Sacken's swan song throws much light on the early days of the study of the flies, the arguments about the bases for classification of the order and the personalities involved. The book is divided into three parts; the first deals with the author's work in St. Petersburg, the United States and in Europe, at Heidelberg, after 1877. The second includes accounts of his relationships with other entomologists, dissertations on classification and notes on the collections of North American Diptera. The third part is a record of all Osten Sacken's entomological publications which runs to 35 pages.

There is much in the text which tells of human beings and their foibles and, as might be expected from the title, the tenor of the writing is often egotistical and critical of his contemporaries. It was this aspect of the work that I found most fascinating. All the leading entomologists of his day who were at all concerned with the Diptera seem to have received his attention and for those interested in the history of entomology and the men who established the foundations upon which we continue to build today this book will prove both informative and often amusing.

Mr. Smith in his preface and appreciation of Osten Sacken's work gives a short history of Osten Sacken's career. He was born in St. Petersburg in 1828 and although his family was of German origin he entered the diplomatic service of the Czar as Russian Consul-General in New York. There he collected flies over a period of 21 years which he sent back to Germany to Hermann Loew. They collaborated in the production of *Diptera of North America* and his pioneer work on the flies of the United States is undoubtedly the basis of his claim to a place among the great entomologists.

P.W.C.

World of Butterflies—A Pictorial Map. Compiled by Michael Bryan; illustrated by Stephen P. Cocking. Folded 160mm x 260mm, Open 760mm x 1010mm. John Bartholomew & Son Ltd., Edinburgh, 1979. Price £1.00.

The old established and well-known firm of map makers, John Bartholomew & Son, have of late been breaking out into other activities, notably the issuing of maps and charts showing the location and interest of, for instance, antiquities and historical sites. This one deals, worldwide, with butterflies and is clearly designed to take advantage of the present great upsurge in interest in natural history. It is issued, as are so many maps, in the form of a folded chart but would in our view have been far better issued in rolled form, for opened it is of size and appearance designed to be placed on a wall.

The chart consists of a world map delineating the zoogeographical regions and a few simple introductory remarks. Marked on the map are the localities from which the 35 butterflies, arranged in rows on the rest of the paper, originate. Under each species is its name and brief

but interesting remarks. All the specimens are apparently shown at natural size although this might not be evident to an uninformed person. We also think it a pity that not all are named to species (*Colotis*, *Tenaris*). In a work showing such a minute selection of the total number of butterflies, designed for the general public, a known similar species would surely have been better.

On the whole the colouring is good and accurate, but in a few cases has gone wrong somewhere. For instance *Limentis populi* is far too dark and indistinct; too dark also are *Papilio antimachus*, *Danaus plexippus* and our own British swallowtail which, incidentally, must be a rather unique specimen having been caught by the late and very well known Richard South at that very unrecorded locality, Soham, Cambridgeshire. However this is a chart—or map—to be mounted on the wall, not too high, however, or the legends, in rather small print, will be unreadable.

This publication is useful both to decorate a room, or to produce as a quick sample of butterflies to quicken somebody's interest. For the price it is well produced in an eye-catching map-type folder.

B.O.C.G.

Insects on Stamps by F. G. A. M. Smit., pp. 78; A5. Published by the Author. Tring 1978. Price £1.75. [Obtainable from E. W. Classey Ltd.]

The state of *Insects on stamps* is by now in the situation of British *Insects* as known at the time of Moses Harris's "Aurelian". Many are known, but more are being discovered (published) year by year. It is now some twelve years since Mrs. Lilley's "Animals on stamps" (which included insects) was published and this book now contains nearly as many insect stamps as the previous one did animal stamps, but is not, unfortunately, illustrated.

Stamps depicting insects are issued for a variety of reasons. These include commemorative issues (Malarial Eradication year); Rarity or special interest of a local species (*Sasakia charonda* from Japan); Interest as part of a regular series (Swiss Pro Juventate issues); or plain money-making (various gulf oil states). Generally, but by no means always (Fujeira) the insects depicted occur in the country of origin of the stamps.

Curiously enough the majority of the issues of the past ten years are very accurate reproductions of the living insects and are correctly named. This fact alone makes many of these stamps collectable since they can be used for the correct identification of a number of foreign species being far superior as illustrations to many depicted (or rather not depicted) in Entomological books. This catalogue—subtitled incidentally "a cross-referenced checklist"—therefore serves a most useful purpose. It is divided into sections giving, in order:— Contents (by Insect Order and family); alphabetical list of issuing countries with the reference to

the numbered species of insects depicted on their stamps. This section is followed by the list of 955 insects, grouped by Order and genera the whole being consecutively numbered, and giving the Countries issuing the stamps depicting the said insect, and the denominations of the stamps. Since many insects have been depicted a number of times both by the same and by different countries, this is the largest section and represents some two and a half thousand different stamps. Finally there is an alphabetic index of the insects which relates them to their number in the previous section.

It should be emphasized that this is a check-list of insects as they relate to being depicted on stamps. It is not a stamp catalogue in the general meaning of the term as applied by "Stanley Gibbons." As a true philatelist too, the author has omitted bogus issues (ie. those printed to attract money from naive collectors and never ever used for prepayment of postage!) and also anthropomorphic representations and cases where the insect is subsidiary and only incidental to the main philatelic theme. We feel that the first omission is a pity (although we understand his purist reasoning) as most philatelic shops, as well as packeted material, contains these bogus issues and some of them at least will readily come into the hands of the entomologist and even the philatelist before he realises what they are. Some of them too are superb reproductions and usable by the Entomologist for identification.

We think it would have been helpful to have had "unidentified species" (many of which are identifiable to genus or family) included in the index. Although typeset, not printed, this is quite a well produced and bound book in an attractive orange cover and reasonably priced. For anyone with the slightest interest in the subject it is indispensable.

B.O.C.G.

Remaindered Books

The books below, originally published only a few years ago, are now being remaindered by various shops at such considerably reduced prices they all represent real bargains.

The Dictionary of Butterflies and Moths in Colour, by E. Laithwaite, A. Watson, and P. E. S. Whalley. Originally published in 1975 at £12.50, now available at £5.00. For further details see review in *Bull. amat. Ent. Soc.* **35** pp. 41-44.

The Constant Pest, by George Ordish. pp. 240. 8vo. Peter Davies. London, 1976. Originally published at £6.50, now available at £1.00.

It surprises us that such a good book should be now offered so cheaply. There are two reasons that spring to mind. Firstly the original price was too high for the time and potential market and secondly the complete lack of the right advertising to reach those who might have been interested.

The sub-title of this book is "A short history of pests and their

control". This wide and vague title ("Pests") does in fact mean "Insects" and basically this is a well-illustrated, well-printed, well-bound and nicely produced history both of biological and other early control methods and of the rise and fall of insecticides, the book ending on the optimistic belief that biological control will eventually take over.

George Ordish is the author of many books and is also the translator of the 'The World of Ants and Animal Societies' by Remy Chauvin. He writes in a lively and interesting style and shows both a grasp of his subject and an authoritative knowledge of and interest in, related and aposite subjects.

In this book, which is illustrated both with half-tone plates and tolerably well produced reproductions of old engravings and woodcuts, we start off with an account of Neolithic pests and are taken through old accounts and customs right up to the present day and the future conjectured. All in all this gives us a most entertaining and readable account which is greatly helped by quotations from earlier authors. From there it can be seen how very ancient customs, "common sense", were based on accurate knowledge and their corruption was often due to forgotten knowledge and religious bigotry. Altogether a most entertaining book and a mine of information. An absolute snip at the present price.

Public and Private Life of Animals illustrated by J. J. Grandville. pp. 312. 8vo. Paddington Press 1977. (Reprint of 1877 edition). Originally published at \$6.95, now £1.20.

This attractively bound and printed re-issue of a french work of 1842 is very well done and 99% cheaper than a copy of the original edition! It is however strictly for those with an interest in anthropomorphism who delight in fine illustration of which it is a pity there is not more, for Grandville was a fine artist with imagination and the stories which serve to hang the illustrations are very trite, in places obscure and difficult to follow but also full of political overtones (the author/illustrator was persecuted by Louis Philippe) which might or might not apply today.

Although not confined to insects, there being also many illustrations of mammals and birds, there is little doubt that Grandville was at his best when he depicted insects and there are often one or two even in the otherwise non-entomological illustrations.

Perhaps however the chief interest in this book was that Grandville, while he had his sources in artists of the Renaissance, was himself the source from which later anthropomorphic illustrators have based their ideas. This can be seen in the work of Renard and Becker in France and in England by the illustrations to Alice in Wonderland and the various books of Beatrix Potter up to the modern such as those of Alan Aldridge for "The Butterfly Ball and the Grasshopper's Feast".

While this is not a book for everyone, it should on no account be overlooked by those who like mid-Victorian drawings.

B.O.C.G.

The Aurelian — A correction. The Editor regrets that due to a typographical error the wrong subscription price was given for this journal in our review on page 21 in the February issue. The publishers have asked us to point out that the journal is quarterly and the subscription rate per annum is £2.75 Inland, £3.50 Overseas.

STOREBOXES

To make one box 15" x 9 $\frac{3}{4}$ " x an overall depth of 3 $\frac{1}{4}$ " you will require:—

2" x 1" prepared softwood, 4 pieces at 15"
4 pieces at 9"

2 pieces of Hardboard or 3 ply 15" x 9 $\frac{3}{4}$ "

Wood glue: (Unibond)

$\frac{1}{2}$ " panel pins

1" panel pins

1 pair of 1 $\frac{1}{2}$ " hinges (brass is often used but they are expensive)

Screws ($\frac{1}{2}$ " threes)

Hook and eye

2 pieces of sheet cork approx. 13 $\frac{1}{2}$ " x 8 $\frac{1}{2}$ " (available from Watkins & Doncaster)

If you plan to make only one or two boxes a jig (Fig. 1) will probably not save any time but for making 3 or more a jig will help to produce boxes of uniform size and shape.

To make the jig you will require a piece of 7 ply approx. 15" x 24" (this large size is not essential but the larger the base the more stable the jig will be). You will also need 3 pieces of hardwood 2 $\frac{1}{2}$ " x 1". Two of these should be about 20" and the third about 10" long. They are screwed and glued into position as shown in Fig. 1, the screws being driven in from beneath. Care must be taken to see that the basal angles are 90°. A piece of 2" x 1" soft wood should be placed in the gap to ensure the 2 main pieces are the correct distance apart. 2" x 1" softwood is, in fact, 1 $\frac{3}{4}$ " x $\frac{3}{4}$ ", the anomaly being explained by the fact that it is prepared from 2" x 1" sawn timber. The difference is lost in preparation. The distances 9" and 15" should then be marked on the jig and squared around with a set square. Next cut down to $\frac{3}{4}$ " above the base plate. Accuracy is very important with this cut and a tenon saw should be used. The jig is now complete.

The 2" x 1" must now be rebated. This is the trickiest job for the amateur.

Not everyone has access to a rebate plane. All the 2" x 1" should be rebated as in (Fig. 2). A Joiners shop will supply 2" x 1" rebated to your specification. Another possibility is to buy some thin strips of

Fig. 1. (Jig)

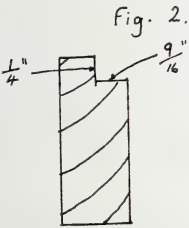
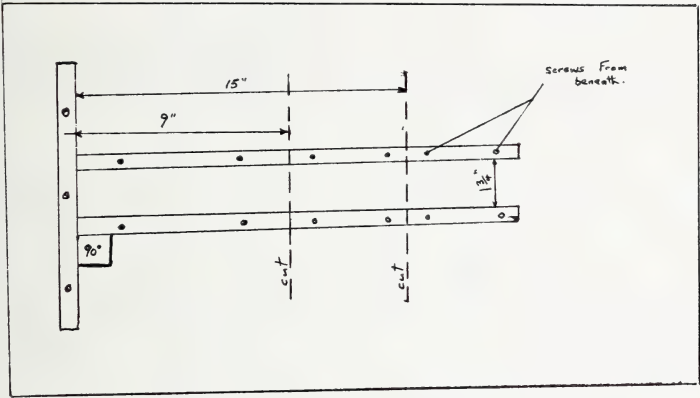
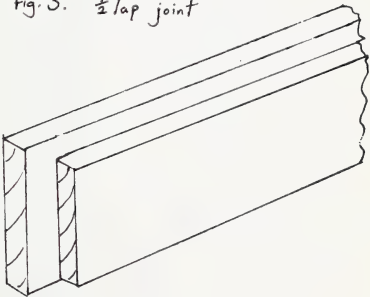
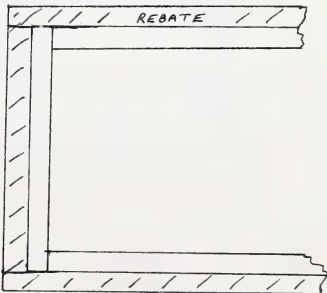
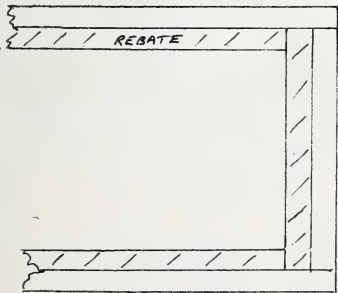


Fig. 3. 1/2 lap joint



Box assembled ready for gluing and pinning.



wood $\frac{3}{8}$ " x $\frac{1}{4}$ ". This can be glued and pinned around the rim when the box is made up. This will provide a false rebate. When the wood is rebated it must then be cut to size. I find it convenient to make 3 or 4 boxes at a time.

Place a waste piece of 2" x 1" in the jig to protect the base plate then push the wood to be cut firmly to the end of the jig and cut. Repeat as necessary, being careful to avoid a build up of saw dust either beneath the wood or at the end.

Now the half lap joints must be cut. Place an off-cut of your 2" x 1" upright against the base inside the jig this has the effect of making your 15" cut 14 $\frac{3}{4}$ ". Place one 15" piece flat in the jig rebated upwards and cut down to the rebate. Repeat this at each end of 2 of the 15" pieces. The other two 15" pieces are then placed flat in the jig rebated side down. These are then cut to the rebate. The ends of all 4 pieces are marked round and the half lap joints are cut out with a sharp chisel. Fig. 3 shows the half lapjoint of the bottom half of the box. The top would, of course, have the rebate on the opposite side.

The pieces are then offered up together and glued and pinned. Being careful to keep all the pieces in the same plane, punch and fill the pins and wipe off any excess glue. The plywood top and bottom of the box can now be fixed. Put the 2 halves of the box together and pin and glue the top, turn the whole box over and repeat. The edges can now be trimmed and sanded. Holding the box tightly shut fix the hinges and likewise the hooks and eye, ensuring that the hooks pull the box tightly closed.

All that now remains is the fixing of the cork. I find copydex ideal for this job. Finally papering — and ordinary wallpaper paste is ideal. Be careful not to allow the paper to wrinkle.

Of course the sizes I have mentioned can be adjusted to your own requirements. The type of material can also be varied.

D. A. Smith (5786)

NOTES ON SPECIMENS BRED FROM A GALL OF *BIORHIZA PALLIDA*

A gall of the above species 20mm. in diameter was collected in Sutton Park, West Midlands, on July 25th, 1977 from the *Quercus robur* on which it had formed. It was placed in a glass jar and put in a cupboard facing away from a window and adjacent to a radiator, which operated at a low level for two hours per day the room only being intermittently heated otherwise. The first emergences were noted in early August and then there was a gap until early January. From then until the end of April the gall was inspected between two and four times per week but in the following list only those dates on which emergences were noted are given. The complete list is given in Table 1.

Table 2 summarises the relationship of the species recorded and their total numbers.

P. R. Shirley (5621)

TABLE 1. Emergences from gall

Date	Species	No.	Remarks
2.8.77	<i>Biorhiza pallida</i>	9	
7.8.77	" "	1	Found dead.
20.8.77	<i>Cecidostiba semifascia</i>	1	
"	<i>Megastigmus dorsalis</i>	2F 3M	
"	Unidentified Chalcid	1	Specimen lost.
9.1.78	<i>Syntomaspis apicalis</i>	1F 1M	
6.2.78	" "	1F	
13.2.78	" "	1F	
22.2.78	" "	1M	
26.2.78	" "	1F	
27.2.78	" "	1M	
1.3.78	" "	1F 1M	
3.3.78	" "	1M	
"	<i>Megastigmus dorsalis</i>	1M	A doubtful identification as this ran to <i>M. dorsalis</i> in Askew's key but did not have yellow thoracic marks.
6.3.78	<i>Syntomaspis apicalis</i>	1F	
8.3.78	" "	1F	
10.3.78	" "	1M	
12.3.78	" "	1F	
15.3.78	" "	1F	
21.3.78	" "	2F	
24.3.78	" "	4F	
26.3.78	" "	1F	
28.3.78	" "	1F 1M	
30.3.78	" "	1F	
3.4.78	" "	1M	
4.4.78	" "	2F	
7.4.78	" "	1F	
11.4.78	" "	1F	
17.4.78	" "	3F	
19.4.78	" "	1F	
22.4.78	" "	1F	
4.6.78	<i>Mesopolobus jucundus</i>	1F	

TABLE 2.

Summary and relationship of species recorded from gall.

Family	Species	No. M.	No. F.	Status
(Superfamily Cynipoidea)				
Cynipidae	<i>Biorhiza pallida</i>	10 in total		Gall causer.
(Superfamily Chalcidoidea)				
Pteromalidae	<i>Cecidostiba semifascia</i>	1 only		Parasite
	<i>Mesopolobus jucundus</i>	1		Parasite
Torymidae	<i>Megastigmus dorsalis</i>	3	2	Parasite
	<i>Syntomaspis apicalis</i>	8	27	Parasite

Plus one unidentified Chalcid and one doubtful *M. dorsalis*. This gives a total of 54 insects, 10 Cynipids and 44 Chalcids, emerging over a period of ten months.

REFERENCES

- ASKEW, R. R. 1961. On the Biology of Oak Galls of Cynipidae. Hymenoptera in Britain. The British Trust for Entomology.
- EADY, R. D., QUINLAN, J. 1963. Handbooks for the Identification of British Insects. 8 Part 1(a). Royal Entomological Society of London.

ARABIAN NOVELTY

There can be few entomologists in Britain who have not seen, either in the flesh or in print, the Common Swallowtail (*Papilio machaon* L.) It is represented by numerous subspecies from eastern England across Europe, Asia and northern North America, flying in such diverse habitats as arctic tundra, marshland, woodland meadows and even the central saharan deserts.

During the last ice-age, when heavier rainfall promoted a more luxuriant vegetation over the Arabian Peninsula, this species probably occupied the entire area. However, as a warmer and drier climate set in,



Fig. 1. Eastern Saudi Arabia.

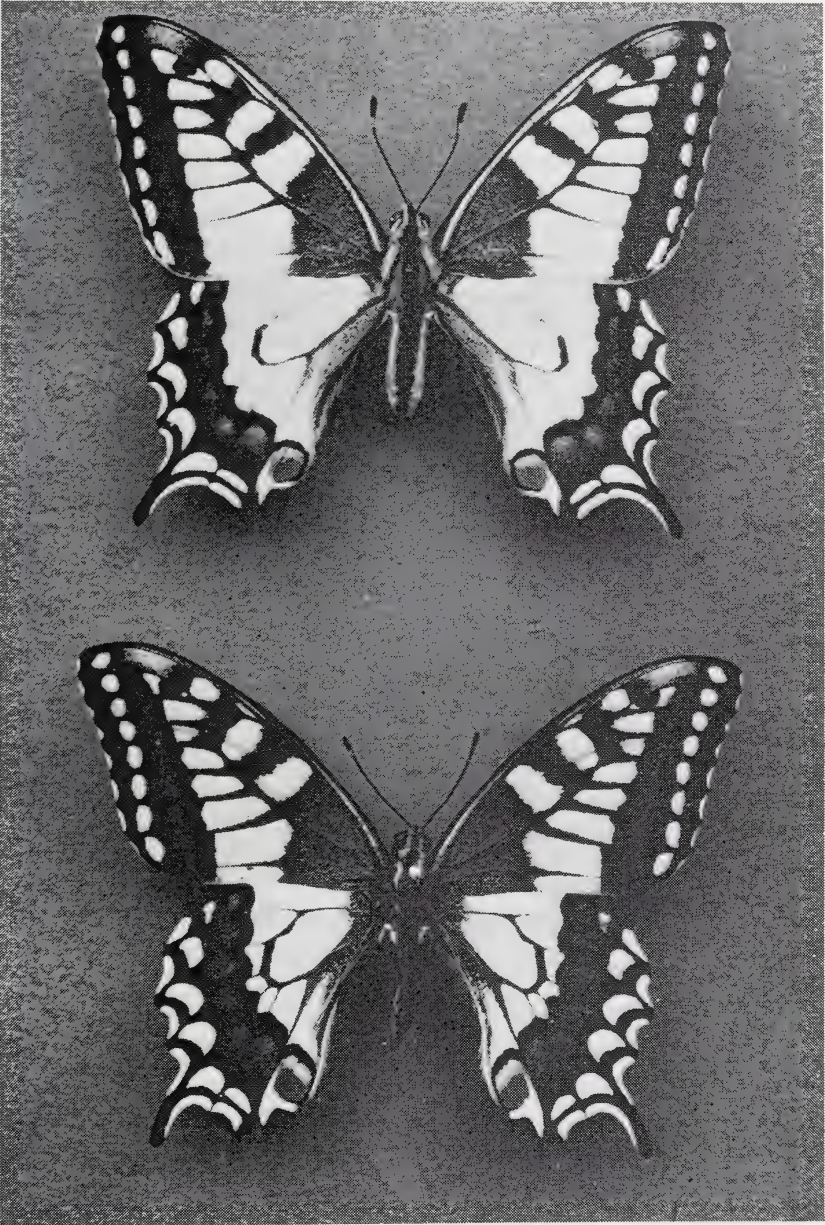


Fig. 2. Typical males of the second brood of *P.m. gorganus* (above) from southern Austria, and *P.m. syriacus* from Hofuf on the edge of the Al Hassa Oasis.

much of the vegetation retreated to refuges, and so did *P. machaon*. Today, this species is found on the peninsula as three separate subspecies — *rathjensi* from the western mountains; *muetingi* Seyer, from eastern Oman, and *syriacus* Verity, from the Al Hassa Oasis in eastern Saudi Arabia.

Although *rathjensi* is indeed an isolated population dating back to the last ice-age, the status of the other two subspecies is less certain as both rely on present day cultivation methods, as well as being but isola-populations of the subspecies concerned. *P.m. muetingi* has its main range in southern Iran and considering the close proximity of this area to Oman and the species habit of wandering, as well as little difference between the two populations, *muetingi* probably only arrived in recent times.

The same is probably true for the Al Hassa population of *syriacus*. In the 1920's, Eller originally named this colony as subspecies *arabensis*, but gave no description or type locality. Examination of a number of 1978 individuals shows quite clearly that this Saudi population is but an isolated colony of *P.m. syriacus*, which has its main distribution from Mesopotamia (Iraq) across Syria and Jordan to Lebanon and Israel.

However, Al Hassa examples are less variable, having constant characters found in only a small portion of the parent population, such as the broad, tapering, dark discal band on the forewings, and much less variation in colour and patterning between generations. There is, though, one feature virtually restricted to the Al Hassa colony — the hindwing tails are broad and curved. These features would indicate that separation had occurred in the not to distant past.

In Al Hassa, *machaon* flies from mid November to mid April in a number of overlapping generations, usually four. Occurring in definite breeding colonies, adults (89-98 mm.) prefer flying along the edges of Lucerne fields, although during hot weather most take to the shade beneath Date Palms, where they seek out the flowers of Sweet Basil (*Ocimum basilicum*).

Impregnated females tend to spend more time investigating clumps of Fennel (*Foeniculum vulgare*) and *Haplophyllum tuberculatum*, the latter being a herb member of the orange family (Rutaceae). It is on these that the pale yellow eggs are laid, often several to a plant. In the case of Fennel, the lower and older leaves are preferred.

The subsequent larval and pupal stages then follow those of the central european subspecies *gorganus* Fruhstorfer. However, unlike that subspecies, the hot summer months are spent as a pupa.

A. R. Pittaway (4802)

LARGE NUMBERS OF HORNETS IN A MOTH TRAP AT ASHURST, HAMPSHIRE, IN 1978

The article by B. R. Stallwood (*Bull. Amat. Ent. Soc.* **38** 1978 3-6) prompts me to record the following observations made on hornets (*Vespa crabro* L.) in the years 1976-78. In general, hornets are fairly common in and around the New Forest. It is not unusual on sunny days in May to see queen hornets flying fast and purposefully at heights of 3-6 metres, while in late summer and autumn workers may often be seen at Buddleia flowers by day and attracted to lighted windows by night. Entomologists who run MV traps at night in the New Forest in early summer sometimes attract queen hornets to their lights.

I have run a Robinson MV trap (125w) almost nightly from 12 July, 1976 and throughout 1977 and 1978 in my garden at Ashurst, Hants (about 1 km outside the eastern border of the New Forest). In 1976 very few hornets were attracted to the trap (no record was kept) but I observed a steady stream of workers visiting the flowers of Buddleia in Lyndhurst car-park on 22 August. In 1977, 31 workers were caught in the moth trap between 1 August and 12 October. In 1978 the number of hornets caught in the trap increased enormously in relation to previous years, presumably because of a nearby nest, although this was never found. The numbers and dates in 1978 are given in Table 1.

TABLE 1.

Numbers and dates of hornets caught in 1978 in a moth trap at Ashurst, Hants.

Queens	2	2 June, 9 June
Workers	337	9 August - 5 November
Drones	14	8 - 27 October
Max. number in one night	19 workers	24 September

All of these entered the trap during the hours of darkness, since the trap was switched off and closed at dawn. Hornets were often seen in and around the trap near midnight, when those inside made energetic, repeated and usually unsuccessful attempts to escape. Even if one succeeded in flying out through the base of the funnel, it almost always slid or flew back into the trap, apparently bemused by the light. A moth trap containing a dozen flying hornets, all intent on escape, is a fearsome and noisy spectacle!

Usually the trap was emptied at 800 - 1000 hours and the numbers of hornets and the numbers and species of moths were recorded. If this was not possible, the trap was always placed in the shade early in the morning so that no insects were killed by the sun's heat. Under these circumstances, by early afternoon most (50 - 100%) of the night's catch of hornets were dead and by early evening all were dead. Those surviving to early afternoon were unable to fly and were placed on vegetation in the garden; whether, in general, they then died from exhaustion or were preyed upon is not known. Even if the trap was

opened at 1000 - 1200 hours, many were unable to fly on release. Most were able to fly away if released before about 1000 hours. Judging from the evidence given below, it seems unlikely that these deaths were due to starvation; possibly the hornets lacked some vital pheromone emanating from the queen or from the nest.

Perhaps the most interesting aspect of the activity of the hornets was the fact that they killed large numbers of moths in the trap. The act of slaughter was never observed, but there was no doubt of the identity of the killers since the characteristically mutilated moths only appeared when there were fair numbers of hornets in the trap. Possibly the hornets initially stung their victims, intending to carry them back to the nest. Often they neatly removed all four wings before dismembering the rest of the body, separating head and thorax from abdomen. Many of the moth victims were identified from wings alone. Many abdomina were missing, suggesting that the hornets had either eaten them or carried them from the trap. The moths which were killed are listed in Table 2.

TABLE 2.

Numbers and species of moths which were killed by hornets in moth trap (28 Aug. —21 Oct, 1978).

(m denotes mutilated but not killed; usually the wings were removed from only one side in such cases.)

<i>Ennomos fuscantaria</i> (Dusky Thorn)	15
<i>Noctua pronuba</i> (Large Yellow Underwing)	9
<i>Diloba caeruleocephala</i> (Figure of Eight)	7
<i>Xestia xanthographa</i> (Square-spot Rustic)	6
<i>Omphaloscelis lunosa</i> (Lunar Underwing)	5
<i>E. alniaria</i> (Canary-shouldered Thorn)	4 + 1m
<i>N. comes</i> (Lesser Yellow Underwing)	3
<i>Campaea margaritata</i> (Light Emerald)	2
<i>Tholera decimalis</i> (Feathered Gothic)	1 + 1m
<i>Phlogophora meticulosa</i> (Angle Shades)	2
<i>Autographa gamma</i> (Silver Y)	2
<i>Trichiura crataegi</i> (Pale Oak Eggar)	1m
<i>Drepana cultraria</i> (Barred Hook-tip)	1
<i>Habrosyne pyritoides</i> (Buff Arches)	1
<i>Cymatophorina diluta</i> (Oak Lutestring)	1
<i>Chloroclysta truncata</i> (Common Marbled Carpet)	1m
<i>Opisthograptis luteolata</i> (Brimstone)	1
<i>E. erosaria</i> (September Thorn)	1
<i>Colotois pennaria</i> (Feathered Thorn)	1
<i>Pheosia gnoma</i> (Lesser Swallow Prominent)	1
<i>N. ianthina</i> (Lesser Broad-border)	1
<i>Paradiarsia glareosa</i> (Autumnal Rustic)	1
<i>Diarsia rubi</i> (Small Square Spot)	1
<i>X. c-nigrum</i> (Setaceous Hebrew Character)	1
<i>Mamestra brassicae</i> (Cabbage)	1
<i>Lithophane leautieri</i> (Blair's Shoulder-knot)	1
<i>Dichonia aprilina</i> (Merveille du Jour)	1
<i>Dryobotodes eremita</i> (Brindled Green)	1
<i>Gortyna flavago</i> (Frosted Orange)	1
Total: 76 individuals of 29 species.	

Finally, it is worth recording that I was never stung by a hornet. Naturally, care was taken when emptying the trap, but by this stage the captive hornets were sitting on the undersides of the egg-cartons resting. In general, even when they were flying and attempting to escape, they did not appear to be aggressive to humans.

Dr. J. C. A. Craik (5990)

FURTHER OBSERVATIONS ON THE HORNET, VESPA CRABRO L.

Prompted by Mr. Stallwood's observations on *Vespa crabro* (the Hornet) my own may be worth putting on record.

Over the years I have been engaged on Nature Conservancy sponsored field work, mostly entomological surveys of ancient parklands in Herefordshire, and in most years encounter several hornets. Mostly these have been queens flying about hollow trees, perhaps in search of suitable nesting sites. The majority of my survey work has centred on that famous entomological site Moccas Park, and as a result most of my observation have been made there.

During the summer of 1978 numerous workers were noted on one visit flying about a mature beech, often three or four being noted at one time. Inspection of the trunk did not reveal any nesting site, nor were any hornets observed entering the canopy. In previous years I had only noted queens in the Park, and to date I have been unable to locate an occupied nest. Behind Park Lodge there is an ancient nest exposed in the shattered trunk of a hollow standing oak.

By chance, in July 1977 I located a nest in the soil under a hedge at the edge of a field at Llangua (Llangiwa), just over the Herefordshire border in Monmouthshire. At the time I thought this to be an unusual nesting site, but during conversation with Mr. D. Chandler (Keeper at Moccas Estate) I learned that several ground nests were in use in Moccas village during the summer of 1978. Some, especially when situated close to houses became a nuisance and were dug up or otherwise destroyed. Unfortunately the numbers of nests is not known but it would seem to be more than two or three.

Both Mr. Chandler and his predecessor Mr. L. Slaney often mentioned to me the habit of the hornet entering rooms at night, attracted by the light and noisily circling the bulb and blundering into things.

Now that I have permanently moved to Herefordshire I may be able to gain first-hand experience of their nocturnal activities.

J. Cooter (3290)

A COLLAPSIBLE HANGING CYLINDER CAGE FOR INSECT REARING

Earlier authors (Gardiner 1974; Crotch 1956) both investigated the design of a collapsible netting cage which could be taken into the field

or quickly set up when needed for the pairing of adult lepidoptera. The disadvantages with both designs was the shape, usually a cuboid. It is usual in the design of a cuboid netting cage to provide a support for the edges, of which the most frequent type is furnished by wooden rods or dowels, but these present a problem at the corners and Crotch suggested the use of predrilled wooden blocks. This all leads to added difficulty in construction, especially for the amateur, added cost as well as the lengthy time required to erect the cage. The latest documented cage (Gardiner) does away with the problems of wooden or wire support and relies on the user finding a suitable position to place the cage, either a room or a cuboidal metal frame. In opting for a cylindrical cage the problems of support and construction are largely eliminated.

CONSTRUCTION

The diameter of the cage will be governed by the diameter of the rings that are used. In Fig. 1 the type of ring is copper and can be purchased at modest cost from shops which retail materials for the construction of lampshades. The rings come in a variety of sizes but the author found 12" and 14" rings suitable for his uses, though for large pairing cages they might have to be made from stout wire and soldered to shape using a dustbin or similar shaped object to get the correct shape. These rings are then covered with cotton tape available from the same source; the stitching should be such that the tape is slack enough to allow the attachment of the netting at a later stage. Fishing line is highly advisable if the cage is going to be used as a sleeve for the outdoor sleeving of larvae or other insects.

The sleeve is simply a cylinder of netting with drawtapes at each end and a number of rings. Rings should be spaced at intervals of 8"-10" for the greatest stability. As this structure will be used for outdoor work it is advisable that they are painted with a waterproof paint to stop corrosion; aerosol car paints are ideal for this type of work and will greatly lengthen the useful life of your cage. The netting used for sleeve construction is best made in white, or some other opaque material to avoid the ravages of birds. The author used curtain netting as it was extremely tough and light, and could be obtained with very small meshwork sizes for the smallest of larvae. Practically any size can be built by adding more rings and lengthening the netting cylinder.

The hanging sleeve cage was built expressly for the pairing of lepidoptera when the author was collecting abroad. The design exactly imitates that of the sleeve with the difference that one end is permanently closed. This is easily effected by sewing a piece of netting across the last ring and leaving the opposite end open for access. It may be preferable to make this cage out of black entomological netting as retailed by most of the large dealers. This allows unrestricted vision but sacrifices some of the inherent strength of curtain netting. The author used curtain netting for the cylinder with black netting at the bottom. It is purely a



Fig. 1.



Fig. 2.

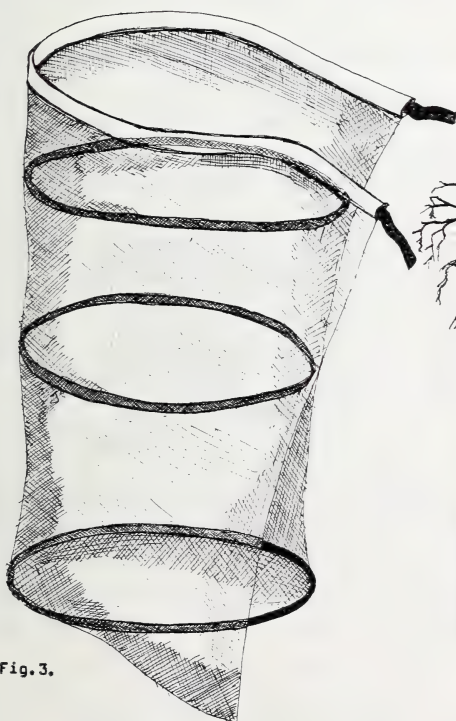


Fig. 3.



Fig. 4.

M. Hadley

Fig. 1. A copper ring.

Fig. 2. The ring is covered with cotton tape.

Fig. 3. Several of these cotton covered rigs are stitched onto a cylinder of netting, with a drawtape at the top.

Fig. 4. Completed cage hung from a convenient tree branch.

matter of personal preference whether one hangs the sleeve as in Fig. 4. (Drawtape uppermost) or with the drawtape facing downwards, in which case three equi-distant tapes require to be sewn onto the bottom ring for this purpose.

In the authors view the cage has the following advantages over previous designs:

1. Cost: very inexpensive with nearly all the materials available around the home. If purchased the total cost of a three foot by 14 inch cage is under £2.
2. Collapsible: the largest measurement is the diameter of the rings, it will fit into any reasonable sized suitcase or bag.
3. Robust: it frequently survived the author's travels on the continent; if damaged it is easily repaired by gluing patches of netting over the tear.
4. Light: because there is no superstructure of rods or steel tubes.
5. Requires minimal sewing ability: it has few seams and therefore does not come apart at them as is so often the case with cuboid designs.
6. Sterilisable: for research purpose or livestock rearing the whole cage is easily sterilised in an autoclave or with wet heat methods.

The following disadvantages are however admitted.

1. Because it is a cylinder and lacks any superstructure the possibility exists that it will fold up if knocked off its support trapping the insects inside, though experience has shown this seldom results in a fatality.
2. Corrosion: the rings, as mentioned earlier, will corrode (form green verdigris) as they are copper. This can be prevented by painting before the cotton tape is sewn around them.

M. Hadley (5315)

REFERENCES

- CROTCH, W. J. B. 1956. *A Silkmoth Reeler's Handbook*. Amateur Entomologist's Society.
- GARDINER, B. O. C. 1974. A Collapsible Cage for use in the Rearing and Study of Large Insects. *Entomologist's Gazette*. Vol. 25.
- STONE, L. S. and MIDWINTER, H. J. *Butterfly Culture*. 1975. Blandford.
- VILLIARD, P. 1969. *Moths and How to Rear Them*. Funk & Wagnalls — New York.

LACEWINGS AND BEES — A PUZZLE

As a beekeeper, one of my great pleasures this year has been my observation hive, a home made affair placed indoors in an upstairs room by a window. A tunnel leads through the open window, as an entrance, and all other gaps are blocked up. Thus, I can watch bees entering and leaving as well as seeing their activity within the hive. The hive has been a great source of interest to myself, family and friends, but come September it had to be dismantled so that the bees could be united with

a colony for over wintering. On the table which supported the hive was a certain amount of debris and it was whilst clearing this away that I came across a small larva, about 4 mm long and with what appeared to be a pair of pincers on the head.

Fearing that my bee colony may have been subjected to some sort of parasitic invasion I collected the larva and placed it in a glass topped box with a worker bee. The larva appeared to take no interest in the bee which I later removed and instead placed in the container, on the underside of the glass, a drop of honey. The larva approached the honey and inserted its 'pincers'. Through a magnifying glass the larva could be clearly seen to be sucking the honey through what I now realise, are its mouthparts. I made some drawings of the larva, which I was now convinced was some kind of honey robber and showed these drawings to various beekeeping acquaintances. I am not an entomologist myself and thought the larva would be known to beekeepers. No-one could say what it was so I sent the drawing to Beowulf Cooper.

From my drawings, Mr. Cooper immediately identified the larva as that of *Chrysopa* (lacewing) and directed me to the appropriate Ray Society Monograph. The normal food of *Chrysopa* is, of course, aphids. I had by now lost my original larva (I told you I am not an entomologist!) but as luck would have it, a bee which entered my window, no doubt looking for the hive, promptly deposited a second larva on the table! This second larva was similar to, but I cannot say exactly the same species as, the first one.

I removed some aphids from sycamore trees near my garden and confined the larva with them. Sure enough, the larva fed on these in a most grotesque manner, namely inserting its pincer-like mouthparts and sucking the body fluids from the living insect. This second larva was larger than the first, about 7 mm long and would feed on about four or five aphids at a session, seizing them in its jaws, piercing, then sucking them dry, often turning its prey to find fresh places to sink its 'pincers'. It did not appear to attack all aphids and, indeed, some did seem able to repel it.

A search of the sycamore trees in my area revealed many aphids and larvae but no larvae of the type brought in by my bee.

On consulting F. J. Killingtons Monograph for the Ray Society I came to the conclusion that my second larva was of *Chrysopa albolineata*. However, the question which occurs to me is 'Why this association with the bees?'. Is the larva simply hitching a ride to pastures new and failing to 'dismount' in time or does it know that it will eventually gain entrance to a hive, and would it normally feed on any of the hive contents. Was my larva which consumed honey simply an opportunist?

It is now too late in the year to make any further observations until the beekeeping season begins again but this time I will be prepared.

Norman Defoe

OBSERVATIONS ON SOME LEPIDOPTERA IN SARDINIA — JUNE 1976

(continued from page 104)

Maniola jurtina hispulla Esper.

This sub-species was certainly most common wherever I explored. The imagines tended however, to favour sheltered areas amongst lentisc bushes and cistus scrub, which afforded this insect some shade. The females were strikingly large and displayed prominent fulvous areas within the discal and post-discal areas of the fore wings. Furthermore, the ocelli towards the apical area of the fore wings were often large and sometimes were even divided into two ocelli with prominent white pupils. The males on the other hand were smaller and universally deep brown with no traces of fulvous colouration. The flight period was extended throughout most of the day, and it was not unusual to find this butterfly still active during the late afternoon when other insects had retired to roost.

Pyronia cecilia Vallantin

This was perhaps the most common species encountered throughout the whole of my holiday, and was recorded as forming colonies wherever dense garigue vegetation was present. Most imagines were male, and it was only towards the end of the second week of my visit that I found the female appearing in any numbers. This species enjoyed hot weather with plenty of sunshine and displayed a reasonably agile flight pattern and also demonstrated an effortless ability to withstand windy conditions on exposed coastal areas.

Coenonympha corinna Huebner

I was delighted to find this endemic species fluttering around close to the ground amongst light cistus scrub both to the west of the hotel as well as around the undercliff area to the east of the cove. Few specimens were, however, ever recorded as being sighted together and I concluded therefore, that this species adopts a solitary existence within limited territorial areas. The flight pattern is weak, although this butterfly moves surprisingly fast upon being disturbed from its resting place. I usually found male imagines quietly sunbathing on a cistus or lentisc leaf close to the ground in the late afternoon when most other insect activity was ceasing to exist. The warm fulvous colouration on the upper sides of both fore and hind wings was most attractive, and the underside of the hind wings displayed as unusual greyish blue metallic sub-marginal band beyond which lay a number of irregular post-discal ocelli ringed with yellow and containing small white pupils. Owing to the apparent lack of females present, it is likely that this species had only just appeared on the wing at the time of my visit.

Parage aegeria aegeria L.

This species was also quite common within shady places amongst

lentisc bushes and never ventured far afield from such territory. The general colouration was deep orange-yellow with dark latticed markings on the upper fore wings and an extended brown basal area on the upper side of the hind wings. This species particularly loved to bask in the sun, but was easily disturbed by the slightest movement. Both male and female imagines were recorded as being present.

Lasiommata megera paramegera Huebner

This is another endemic sub-species to the Island, and although I suspect can be found without difficulty throughout wherever there is dry wasteland, I myself, only recorded a few specimens as being found within a small area lying to the west of the hotel. Owing to good condition of the specimens found, it is likely that this species will be found later in the summer months during most of July and August. Two or three broods probably appear throughout the spring and summer. The notable feature of this sub-species is the lack of the scalloped post-discal line beyond the prominent ocelli within the upper side of the hind wings. Certain intermittent brown markings within the post-discal area of the fore wings are also absent. Furthermore, the general colouration is perhaps a little more fulvous than that normally displayed by the nominate form of this species.

Miscellaneous species and other insects

The only Lycaenids found throughout the whole of the fortnight were one worn female *P. icarus* Rot. (Common blue), which displayed very prominent large orange submarginal lunules on the upper sides of both fore and hind wings, and one male *C. argiolus* L. (Holly blue). The former was found fluttering around a section of the path lying to the east of the cove, and in view of its worn condition I doubted that this insect would have lived for another twenty-four hours. The later specimen was strangely enough found on the beach within the cove, fluttering around a small spring of fresh water which oozed out of the sand a few metres away from the tide line. This one solitary insect appeared at the same spot on the beach on most mornings, but was never seen there in the afternoon! The damp sand must have proved to have been an irresistible attraction in spite of the unwelcome intrusion upon its territory by human visitors!

No Hesperiidæ were recorded at any time. These butterflies are probably on the wing earlier or later which would account for the total absence of sightings during this period in June.

Apart from my specific records as referred to above, I did encounter a few other interesting and somewhat exotic insects. Whilst rambling around the edges of the cultivated land above the undercliff escarpment one morning, I suddenly disturbed a strange dragonfly-like insect with heavily veined wings which displayed irregular brown blotches. This creature was in fact a member of the Myrmeleontidae family (Ant-lions). They are surprisingly large, but display a remarkably weak flight habit

by simply fluttering in a floppy manner for a few metres upon being disturbed, and then dropping down amongst low herbage, where it will remain motionless at rest with wings folded over its long abdomen. However this insect is particularly nervous and is easily disturbed by movement close at hand. I also found within the same terrain a beautiful member of the Ascalaphidae which displayed a striking iridescent green hue on both wings and body. These insects are generally much smaller than Ant-lions, but are not dissimilar in character save that their flight ability is much stronger and they are able to evade capture very easily by appearing to spring into the air at great speed before alighting on other vegetation elsewhere. They also have strange antennae, which are often as long as the length of their fore wings, with a flattened club extremity. Unfortunately, without any suitable source of reference available, I was not able to identify the particular species found. I also found quite regularly amongst low scrub the brown form of the Praying mantis (*Mantis religiosa* L.) This insect was easily disturbed from its place of rest amongst bushes and low scrub and sometimes even flew or scrambled onto my clothing where it remained in a most tenacious manner! I have always found the Praying mantis one of the most fascinating insects to watch and I never cease to marvel at the manner in which it will remain motionless for long periods whilst awaiting to pounce on some unwary prey. Cicadas were rapidly becoming plentiful during the second week of our visit, although during the first week they were entirely absent. The species found was somewhat smaller than those in the South of France and elsewhere and may well be a local endemic species. Another intriguing creature, an Arthropod but not an insect, was found scuttling along the veranda of our chalet—this was the centipede *Scutigera coleoptrata*, which fascinated my two young daughters, since they had never seen anything so peculiar before! This particular arthropod has fifteen pairs of legs, but these are much longer than most centipedes and are multi-jointed with the last pair being so long and slender that they could be mistaken as some form of rear antennae. This creature is capable of moving very fast, and in order to arrest its movement so that I could photograph it effectively, I placed a muslin cloth over it for a few seconds and then removed this covering away in such a manner as to leave it temporarily immobile as if due to shock.

Although my own general observations can only be treated as but a random survey within one small area of Sardinia, I have no doubt whatsoever that a series of sustained surveys throughout the Island, which has such a varied terrain and differing habitats, a wealth of insect life would be discovered. Perhaps one day I shall be lucky enough to have another opportunity to visit this interesting Island where tourism has not yet destroyed the ageless peace and tranquility, which the inhabitants so obviously enjoy.

LETTER TO THE EDITOR

Dear Sir,

I read with interest the letter from M. R. Young in the August 1978 Bulletin. Mr. Young commented on the excellent article by M. D. Bryan (a few thoughts on extinction, rarity and conservation, (A.E.S. *Bulletin*, 37 pp 3-9).

Mr. Young took issue with the ideas on the introduction of foreign species into the U.K. He indicates that he is not concerned about damage to the native fauna, but then states that he feels damage could 'easily occur in some cases'. Presumably those 'some cases' do not concern Mr. Young. His main concern seems to be the distortion of scientific studies that may result.

It is my contention that this objection is irrelevant in all but few species. However I would agree that if introductions are made without at least one generation reared under controlled conditions, parasites or diseases injurious to native species might be introduced. In any event I feel that an important facet of this idea was not raised by Mr. Bryan or Mr. Young. I submit that large tracts of the British countryside have been altered by planting of conifers. The species that would naturally be suited for this flora have been left behind, (the notable exception is the Pine hawk).

Thus we now have large areas of artificially created flora, so it would seem reasonable to introduce an artificial fauna to populate it.

I note that there seems to be no delay on the part of government bodies to bring in foreign conifers, thus why the problem with foreign insects, excluding, of course the pest species.

I would suggest that there are some spectacular N. American conifer feeding moths that could be considered. Together with Asiatic species.

Yours sincerely,

Chris A. Young

LETTER TO THE EDITOR

National Union of Bees (N.U.B.)

c/o The Hives, England.

Dear Sir,

We regret to inform you that due to excessive use of chemical sprays, the bees of Great Britain will be holding a series of one day strikes, leading to an all-out stoppage on 12th June, 1979.

We do not know yet whether other insects will come out in sympathy; flies are seriously thinking of joining the strike although moths and butterflies will probably carry on as normal, pollinating as many flowers as is possible.

Bumble bees have said that they will picket flower beds and will probably enlist the help of militant dragonflies and hornets.

Yours buzzingly,

Brian Bee,

Shop Steward N.U.B.

***Dolbina elegans steffensi* (Lep.Shing), where from?**

In 1912 a new west Palaearctic Hawkmoth was discovered in northern Syria. This was *Dolbina elegans* (O. Bang-Haas, 1912). Over subsequent years further records indicated that this species ranged across southern and eastern Turkey, northern Syria, northern Iraq and northern Iran to Tehran, frequenting hot, dry hills and mountainsides with very light forest or shrubby steppe.

Due to its small size, 40 to 48 mm. wingspan, and drab grayish colour, it was not surprising that this species came to light only comparatively recently. However, it was a great surprise when seven *D. elegans* turned up in south-eastern Europe (Soffner, 1959; Levy, 1968), all being captured during the second half of July at Nessebar, north-eastern Bulgaria.

In 1968 Dr. Popescu-Gorj also trapped four in the Parsarea forest near Bucarest, Rumania. The following year no less than nine specimens surfaced and after comparison with Syrian examples they were pronounced a separate subspecies in 1971 *ssp. steffensi*. Since then it has also been found across the Rumanian border in the southern USSR.

It may be that this subspecies had been occurring in these locations all the time, escaping detection due to small size and a distinct derth of trapping. Or they may have been forerunners of a subspecies expanding its range. More than likely, both reasons apply to some extent. However, the question still remains as to where this sub-species originates from.



There are three possible areas:—

- (1) The mountains of northern Turkey.
- (2) The mountains of central and southern Bulgaria, plus areas of southern Yugoslavia.
- (3) The Carpathian mountains in Rumania itself.

All three areas have the morphology and vegetation types similar to those of southern Turkey where *D. elegans elegans* is known to occur. However, two other factors indicate that the second choice may be correct.

In morphology, vegetation and also climate, this area most closely resembles the range requirements of *ssp. elegans*. Secondly, and most important, due to the previous factors, two other Sphingids associated with *D. elegans* in Asia Minor have isolated populations here *Rethera komarovi* (Christoph, 1885) and *Sphingonaepiopsis gorgonaides* (Hübner 1819).

Of course, the above is guesswork. It may be that *ssp. steffensi* is resident where it was caught. Only time and a bit of effort will tell.

A. R. Pittaway (4802)

REFERENCES

- Bang-Haas, O. (1912) Neue oder wenig bekannte palaearktische Makrolepidopteren VI. Deut. Ent. Zeit., **26**, 229.
- Levy, J. (1968) Zur Schmetterlingsfauna der bulgarischen Schwarzmeerküste. Ent. Nachrichten, **12**, 105.
- Popescu-Gorj., A. (1971) *Dolbina elegans* Bang-Haas (Lep Sphingidae) en Roumanie. Extrait de Travaux du Muséum d'Histoire Naturelle vol. XI, Bucuresti.
- Soffner, J. (1959) *Dolbina elegans* O. Bang-Haas in Europa (Lep. Sphingidae). Ent. Zeit., **69**, 269.

NOTES AND OBSERVATIONS

Curious case of Ruby Tiger and Willow Tree:—The following curious circumstance happened to me nearly eleven years ago—January 1968, and it is the story of a RUBY TIGER CATERPILLAR; On January 2nd, 1968, I was out walking in Drumpellier Park, which is a large area of natural beauty situated between Easterhouse and Coatbridge. I was at the South end of the park, hoping to see some roe-deer which used to frequent that area about that time. The day was extremely cold with frost on top of the already deep snow. I walked to the edge of a sloping wood, and noticed some Crack-willow trees growing along with oaks and other deciduous woodland trees. I stood under one of the Crack-willows and started prising off some of the bark with a penknife. I noticed various hibernating insects and empty chrysalids etc. Then I broke off a piece of bark above my head and there curled in a complete circle on the exposed piece of tree-trunk was a Tiger Moth Caterpillar. The hairs were bright orange in colour and contrasted well with the dark background upon which it rested. I assumed it was a Ruby Tiger.

and thought it a good find. I took it from the tree, and it came to life after a few minutes in my hand. When I got it home I had the problem of feeding etc. I did not know then, that this species probably hibernates without feeding again. It seemed fully grown-being about $1\frac{1}{2}$ " long. I kept it for a day or so, and when the snow melted I released it in the garden. Then about a few days later there was a great gale. Winds of up to 100 m.p.h. were recorded in the Glasgow area and caused much devastation. After the gale ceased I was out walking again in the countryside, noting all the trees which had succumbed to the gale, most of them being partially uprooted and lying over on their sides or on the ground I soon came to the spot where I found the Ruby-tiger and saw that the crack-willow where it had been hibernating had broken almost in two about 6 ft from the ground, the exact place on the tree where I had taken the caterpillar was where the breakage occurred.

This rather strange tale of natural history is perfectly true and happened just as I have written it.

I still pass that place a lot in my walks in the country and although the Crack-willow tree in question is lying on the ground on the slope of the wood, being almost broken in two, the stump still produces fresh leaves every Spring. — F. McCann (6291).

Notes on Collecting Females of the Spring Usher:—This last year Mark Hadley and myself decided to track down the wingless females of as many winter and early spring species as possible. We carried out several evening trips to selected localities around Eastbourne throughout this period and found the females of *Operophtera brumata* L. (Winter moth), *Erannis defoliaria* Clerck (Mottled Umber), *Theria rupicaprararia* Schiff. (Early moth), *Erannis marginaria* Fab. (Dotted border), *Phigalia pilosaria* Schiff. (Pale brindled beauty), *Alsophila aescularia* Schiff. (March moth), and, of special note, *Erannis leucophaearia* Schiff. (Spring usher). The Spring usher females are small and virtually wingless. To find them we first found a locality where the males were fairly common. This was done by looking for them by day on oak trees and by using traps by night. Armed with this information we looked around the wood for the more mature oaks, it did not seem to matter whereabouts these oaks were situated in the woods. The majority had crevices in the bark and in the evening, an hour after dark, the females were found, with a little careful searching from one to five feet above ground, normally secreted in a crevice. This job was made a great deal easier with the aid of a tilley lamp as it gave good all round light and also attracted other moths at the same time!

I would appreciate any further information on any wingless female, especially that of *A. hispidaria*. Finally I wish a big thank you to Mark Hadley without whom most of the trips over this period would not have been possible.—M. Parsons (5983).

July 29th, 1978, Oh what a night!:—On the above night I was invited, along with my neighbour, to run my M.V. light in a friend's garden in the village of Landford near Salisbury. The night was very humid, with continuous thunder but only occasional heavy showers. The temperature remained at 60°F. throughout.

The light was switched on at 9.30 p.m. and in the next three hours the numbers of moths had to be seen to be believed. The air was full of them — just like a blizzard. It was difficult to keep track of all the arrivals and record every species. In all 97 species of macrolepidoptera were recorded but it is considered highly probable that the total far exceeded this. Notable species included Dark Crimson underwing, *Catocala sponsa* L., Pine hawk, *Hyloicus pinastri* L., Lunar yellow underwing, *Euschesis orbona* Hufn., Leopard moth *Zeuzera pyrina* L. and The Shark, *Cucullia umbratica* L.

This was certainly a lucky night for when we arrived home, just a couple of miles down the road, we were told that it had been pouring continuously all evening' — Alan Gange (5700).

An early *Aglais urticae* L. — I would like to report a sighting of one Small tortoiseshell which I saw on February 3rd this year. Although the sun was extremely bright at the time, it could not have been more than 1 or 2° C. This was at 11.00 a.m. in the morning.

Perhaps the sudden burst of sun after weeks of snow had roused the creature from hibernation, although she was so perfect that, if it was not for the temperature, I would have surely come to the conclusion that she was newly hatched. — Kevin Samuels (6340 J).

Entomologist deported from Papua New Guinea:—Smuggling of protected and rare Giant birdwings (*Ornithoptera*) continues in New Guinea despite conservation laws and the prosecution of notorious collectors. The Department of Wildlife has recently succeeded in having deported a well-known entomologist, Raymon Straatman, who, they claim, is reputed to have been involved in collecting protected species on a large scale. He was, however, never actually caught with protected butterflies.

The above news is culled from the News of the British Butterfly Conservation Society to whom we are grateful for permission to reprint. Mr. Straatman is noted for his papers, beautifully illustrated with colour plates, on the early stages of the *Ornithoptera* which appeared in The Journal of the Lepidopterist's Society. Any further details of this affair we can obtain will appear in a future issue. — Editor.

Defoliation by Vapourer moth larvae:—On the 9th August 1978 in a residential part of Birmingham larvae of the Vapourer Moth, *Orgyia antiqua* L. were seen to have completely defoliated a tree of the genus *Crataegus* (possibly the Broad-leaved Cockspur thorn). There were

thousands of larvae on the tree in question as well as on the surrounding roadside verge, footpath, other trees etc. The tree was about 4.5 metres high. — P. R. Shirley.

Parasites from a gall:—An old, large, gall formed by *Diplolepis rosae* L. (Hym. Cynipidae) was collected at Hunt End Redditch on the 21st May, 1978. It contained many flight holes. On the 15th June it was noticed that about sixty Ichneumonids had emerged these being *Orthopelma mediator* (Thunberg). — P. R. Shirley.

NORTHAMPTONSHIRE NOTES 1978

In early February there were more than usual numbers of a large Ladybird (*Coccinella* sp.) still in our gardens and many matings were to be seen but a cold spell towards the end of the month, and I suspect a shortage of food, seemed to stop them increasing into any large numbers.

Undoubtedly a late and poor season for our indigenous species in general but like most seasons there were the brighter spots, discovered if we happen to be in the right place, or more likely put in a lot of field work. Success is often relevant to the amount of work put in: there is the more fortunate side, such as the taking of rare immigrants (*L. boeticus* in 1976), or fine aberrations in our own gardens. On the 9th May I went into my garden (not large and in the town) to look at a few Small whites *P. rapae* L. and among them was a very fresh, completely spotless, ab *immaculata*! In late June it was fairly certain that the earlier, migrant sightings of *cardui* and *atalanta* were not going to develop in the county: this was evident later in September when both were struggling to emerge in poor weather, a brood that surely should emerge in August! In the county much Oil Seed Rape, is currently being grown by our farmers giving yellow fields that glorify our landscape and bring so much joy to the hearts of our local beekeepers (although this particular honey flow is a mixed blessing). This is possibly a contributory factor to the large numbers of the Pieridae seen in the county in 1978. Many areas are now colonized by this plant, some quite large, by the roadsides. On rough ground and many motorway verges all the whites, *brassicae* and *rapae* especially, take to this plant (as also will *napi* and *cardamines* in confinement) I think more observation is needed as to whether the Oil Seed Rape really was a factor in this years abundance of the Pieridae, especially as many areas are not sprayed. It has been many years since I heard local gardeners complaining of the damage done by caterpillars to their greens or seen the toll taken by the Large white larvae on town grown brussels sprouts and cabbage. In late August the imagines of all four species were in very large numbers and taking nectar from a number of plants, those recorded being The Great Willow herb (*Epilobium hirsutum*) Black-

berry (*Rubus* sp.) Knapweed (*Centaurea nigra*) and *Scabious* and *Hieracium* sp. (these had been mown earlier on the roadside verges). What a remarkable and pleasing sight to see, almost, every flower head supporting a feeding white butterfly, nodding in the breeze and the butterflies flying up at each passing car only to hurriedly resume feeding.

Inachis io (The Peacock) was in good numbers on Buddleia including a rather nice large female with a light central patch on each forewing; the fourth taken over the years, they seemed to go into hibernation in early August, I saw none later on *Sedum*, perhaps a good sign for 1979!

On the 20th August I looked in at a local disused railway line in which *tithonus* were flying in large numbers with a large ratio of females, many apparently infertile. The female form especially, with the extra spotting on the forewing (ab *anti-excessa*) being plentiful, but none were extreme.

The swarming of the small black ant (*Acanthomyops nigra*) was most surprising in the second week of October, as a more usual time is early August. This ant is one notably associated with Lycaenid larvae!

During the year I had my first experience with a dipterous leaf miner, one that leaves very little of Dock and Sorrel plants for any lepidopterous larvae to feed on! There appears to be three broods of the miner!

John Payne (5923)

ADVENTURE TO DARKEST AFRICA

THE WILDS OF SIERRA LEONE

Dusk has just fallen in a little tropical West African country, about seven degrees from the equator, and high up on a hillside, overlooking the capital of Sierra Leone, — Freetown, (famous in long past days for being the place where the slaves were freed) three people set up a portable light trap — well perhaps two, and one onlooker — with the hopes and dreams of months, about to come true at last, for surely at any moment now, huge swarms of giant tropical silkmoths, and hawk-moths, will come flying in our direction from every angle, and we will probably have great trouble finding space to put them all

Strangewings flap by, high in the air, — are they huge moths, — bats, birds, . . . or what? All around us, the constant chirping of crickets, or are they perhaps cicadas, or maybe a bit of both, — make an almost deafening shrill piercing noise from near and far. Eight o'clock . . . nine o'clock, — time passes quickly. A large yellow moth flies quickly by us, — but not into our light trap. A larke hawkmoth bangs into the metal roofing of the lonely house beside us, does so a few times more, and then flies away before knocking itself unconscious . . . or worse, — due to the fact that there are certain persons just waiting to pounce, should it ever come close enough to the ground

Almost all alone on this hillside, with wonderful daytime views of dense tropical 'jungle' down below us,—no telephone, no T.V., these strange persons wait . . . and wait . . . Something moves across the ground nearby, and moments later a giant millipede is in the bag . . . Does it bite, we wonder? . . . Oh well, suppose we'll find out soon enough if it does, but we've got away at least once, by picking it up in our bare fingers. A short walk around, and something jumps . . . a lonely toad, but this is merely examined, and released again, for we don't really want the problem of having to feed toads every day. Many more of these are soon seen, hopping around on their night patrols, and no doubt wiping out countless small insects and worms, as they enjoy their evening meal, provided in plenty in this part of the world, where insects of all kinds really 'rule the waves' (or 'rule the land'—in this instance).

Deathly stillness now, all around, as the night grows older . . . Something rustles in the large trees nearby,—jet black against the quite dark African sky . . . Could it be monkies . . . bush babies, parrots . . . babons . . . chimpanzees, or who knows what? The rustling noise gets closer and more frequent,—but whatever it, or they, are, they are not going to make themselves known to us tonight,—though no doubt it, or they, had a jolly good look at us, wondering what that strange light was doing, and perhaps more to the point,— what WE were doing . . .

Another short walk around (longer walks are not really advisable in this area and at this time of night!)—armed only with a powerful torch (and a supply of plastic bags),—and we come to a rotting fallen tree trunk. Shining the torchlight along the rotting wood, and light reveals numbers of giant millipedes,—long black snake-like creatures, with how many legs . . . one, two three . . . it would take all night to count them all . . .

A tiny toad jumps along the tree trunk on its way to its usual restaurant,—that vast never-ending supply of creepy-crawlies, and a menu of delicious delicacies, which are hardly ever 'not on the menu tonight' out here. Large ants crawl everywhere, . . . better keep on the move or they'll find legs to crawl up and bite,—as a certain person will readily confirm . . . Another old dead tree, but this time still standing where it once flourished,—and here, yet more giant millipedes, their shiny black bodies making them easy to pick out, in the bright torchlight. A tiny gecko scurries around to the other side of the tree trunk, not wishing to be viewed by human eyes, and only interested in obtaining its next meal. Far away out to sea, and in the direction of Guinea,—the neighbouring country, which is not very distant in fact,—the night sky is suddenly lit up by a flash of lightning, followed by another, and another, for a long time, but there is no thunder or rain, so it does not bother us. One of the strange things about the weather in this part of the world, is the fact that it can be deadly still with not a breath of wind one minute, and yet within ten minutes, there can be quite a gale

blowing, then back to dead calm again, — all within half an hour. Likewise, tropical storms can blow up within minutes, with torrential rain, which can either last for many hours, or perhaps just minutes.

The hours go by, — ten o'clock, eleven o'clock, twelve midnight. The wind slowly rises, and the leaves in a large banana tree nearby start to flap about. Far far below us, beyond the dense forest area, a thousand tiny lights twinkle in the town, but up here, the mauve light from our moth trap shines out over our domain. But where are all those huge moths? we ask, as the night passes on. Only a lot of tiny moths have so far accepted our invitation to an evening out with us, — all expenses paid, and including a free trip back to England Something bangs into the metal trap . . . perhaps something has decided to come along after all, . . . grab the waiting net nearby, and down to the trap some yards away . . . but we needn't have got excited, for it is only a large green cricket, probably blinded for a moment by that strange light, and perhaps thinking that the moon was a very strange colour and shape tonight.

Large dark wings fly silently overhead, — a bat doing his own personal moth collecting, — guess it would be rather nice to fly about catching all sorts of specimens as easy as he does

At last, it is time to 'call it a night' . . . the trap is switched off, and a couple of rather weary nuts, — sorry, dedicated entomologists, — make their way to some sort of sleep, — rather disappointed about no large moths in the trap tonight, . . . but theres always tomorrow, — another day, — another night, when who knows what might come along".

Well, — the above is a rather 'light hearted' look at an evening spent near the top of a hill called Leicester Park, some miles outside Freetown, and about two thousand five hundred feet high. The above article was in fact written there late one evening (at least the basic notes for it), with geckos sitting waiting half way up the walls over my 'bed', and with all sorts of strange noises going on, on the other side of my window, which by the way, not only had glass windows, but metal bars as well, — a sort of grill affair, — rather like being in prison I suppose, for it would have been quite impossible to get in or out of them, even in an emergency!

The butterflies in this area of the world are quite unbelievable, both in variety, numbers, and colours, so Sierra Leone would be an absolute paradise for anyone who is specifically interested in butterflies. It was in fact, posible to just stand with a butterfly net, in one place, and wait until some huge butterfly just flew in, — rather than try and chase them, for they were so numerous, that we could see more butterflies in minutes, than we would see in a year in England (apart from that, trying to chase butterflies in temperatures not far from ninety degrees and extremely humid conditions, was much too like hard work). Huge swallowtails would fly swiftly past us (and just occasionally into

our net!), while there were countless other species also, including a beautiful giant white coloured species, possibly *Salamis parhassus aethiops*, or some closely related species, and these had lovely tails, similar to Swallowtails. Then there were the beautiful blue butterflies, yellows, tiny skippers, and little blues rather like those found in Europe, — and yet others with a host of different colours. We did in fact catch a small selection of these butterflies, which we brought back in papers, — so hopefully they may be on display at the next A.E.S. exhibition, — though in fact we were more interested in obtaining livestock, such as ova/larvae/cocoons etc.—But the butterflies we saw everywhere were a really fantastic sight. Huge butterflies could often be seen flying about even in the hotel restaurant and other rooms in the hotel! But there are so many there, that people living there don't take much notice if any, of them. (Rather like flies in an English house I suppose, only very much more beautiful).

Then of course there were the praying mantids . . . A waiter in our hotel brought us a huge female one morning, which he had caught for us in the hotel! (For it was not long before almost everyone in the hotel knew that there were some strange English people wishing to collect butterflies and moths etc.!) This specimen is still 'going strong' at the time of writing. (Beginning of December.) Incidentally, praying mantids will in fact eat little pieces of meat, if waved in front of them for a moment on the end of tweezers, — so it is possible to keep them going, even in mid winter, when few if any flies etc. are about. (This applies to fully grown mantids, — young ones may not take to meat!) But I have also found out that they are very fond of spiders, which can be found at most times of the year, and often in the bath, — but strangely, since our return from Sierra Leone I have only caught one or two spiders in the bath, whereas before, I seemed to be catching and disposing of spiders by the dozen from the bath! Perhaps word has got round that all spiders should evacuate the area at once, — or else be prepared for a very painful end, . . . or maybe I've discovered the perfect way of keeping the bath free of spiders, and should advertise the following . . . "Every home should have one . . . keep a praying mantis in the house, and be free of those 'orrible spiders in the bath, for evermore".

(To be continued)



Exotic Entomological Specimens

LEPIDOPTERA — COLEOPTERA — MISCELLANEOUS INSECTS

Livestock of Saturniidae, etc.

Please write for details of our lists, etc.

R. N. BAXTER

**16 BECTIVE ROAD, FOREST GATE, LONDON, E7 0DP
ENGLAND.**

For a personal and interested service

Member of the Entomological Suppliers' Association

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Othoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

Annual subscription — £6.50.

Write for specimen copy to E. H. Wild, 112 Foxearth Road, Selsdon, Croydon, Surrey, CR2 8EF enclosing 60p.

This amount will be taken into account in the first year's subscription

TRANSWORLD ENTOMOLOGICAL COMPANY

offers AES members **Cocoons/Pupae**
low priced – Imported wild material

Actias selene 65p	A. luna 49p	C. promethea 46p
A. polyphemus 59p	A. io 49p	C. regalis 170p
A. atlas and spp. £1.15 – £1.80	P. machaon 69p	
P. asterias 69p	D. plexippus 85p	A. mimosae £1.69
R. orizaba 89p	P. machaon X asterias hybrid £1.10	

also many others in our catalogues

Exotic Insects from South America (first time bargains)

Giant Millipedes £2.25 Scorpions £3.45

Tree frogs £2.35 Centipedes £2.95

Giant Snails £2.95 – £3.95

Praying Mantis Nymphs £2.25

Medium/Large £3.25 Large spp/adults £4.25

Fancy and flower may be available

Giant Spiders £8 – £15 *See lists for details*

Butterfly display frames, empty prices

4" × 4" £1.60 7" × 5" £2.45 10" × 8" £3.95

(discounts available to shops and the Trade)

Black Lights : These won't explode in the rain etc. £9.95

Heater pads DIY type, 10" × 8", 4 @ £4.45

Splash proof type, really useful 50W, 13" × 8"

type only £7.45 100W 15" × 12" £9.25

Phasmids – 14 species are now available !

Specimens – Many different species available at amazingly
low prices, in singles, packs and trade bulk orders !

Special offers on Indonesia/New Guinea areas.

*South American material, just collected by ourselves
now ready — lowest prices.*

Books — Stick and Leaf insects £2.75

Butterflies of the World £9.95

Many other books available

Access/B'card accepted.

SEND FOR OUR NEW DISCOUNT CATALOGUE

LARGE SAE please

Please order pupae **now** to obtain this special offer price.
for supply September. Add p/p 20p. Equipment/Books 60p.

AES Dept. P.O. Box 14, REIGATE, RH2 9PW ENGLAND.

Telex : 8953658 Cables: Butterflies – Reigate

Announcing a New A. E. S. Publication

A DIPTERIST'S HANDBOOK

This long awaited handbook has now been published. Twice the size of the other handbooks in this A.E.S. series, it is a comprehensive practical guide to the collection and study of the British two-winged flies. It has been compiled by a panel of authors who are each experts in their own field. The chapters deal with collecting and study techniques, habitat and ecology, associations with the animal and vegetable kingdoms and an illustrated key to the larval stages of the Diptera. Identification of adults is left to existing literature so that maximum attention can be given to the practical needs of the field dipterist. There are details of reference books to supplement each chapter. Section appendices provide detailed information on specific diptera associations ; these have been brought together for the first time from a wide range of sources. This will be an essential book for the dipterist both at home and abroad and, because of the many associations that the flies have with the other orders, most entomologists will wish to add it to their reference works.

Available from the A.E.S. Publications Agent

Price £6 plus postage.

THE AMATEUR ENTOMOLOGISTS' SOCIETY

ANNUAL EXHIBITION, 1979

SATURDAY, 15th SEPTEMBER

11 a.m. to 6 p.m.

**PALM COURT, ALEXANDRA PALACE,
LONDON**

ACCESSIBILITY – It is easily reached by road from the M 1, the North Circular Road and a variety of routes from Central London (7 miles). Wood Green (British Rail from Kings Cross), Turnpike Lane and Wood Green Stations (Piccadilly Line via Kings Cross) are close by. LT Bus Service (W3) runs from Finsbury Park and Wood Green to the Palace.

PARKING – Space for 2,000 vehicles on the Terrace.

ADMISSION FEE is 20p except for Exhibitors who will be admitted free.

EXHIBITORS AND DEALERS ONLY will be admitted before 11-00 a.m.

TROLLEYS – These are not provided and provision should be made for heavy loads.

ENTOMOLOGICAL DEALERS will be in attendance.

REFRESHMENTS – Normal cafeteria service.

SURPLUS MATERIAL will be welcome for sale on behalf of the Society's funds.

SPECIAL FEATURES are being arranged.

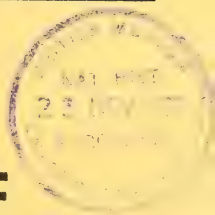
ALL ENQUIRIES to B. F. SKINNER,
5 Rawlins Close, South Croydon, London, CR2 8JS.

VOL. 38 NO. 325



NOVEMBER 1979

**THE
BULLETIN OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**



WORLD LIST ABBREVIATION:
BULL AMAT ENT SOC

EDITOR:
BRIAN GARDINER FLS FRES

The Amateur Entomologists' Society

(Founded in 1935)

President :	B. R. STALLWOOD	7 Markhall Close, Cheriton, Alresford, Hants. SO24 0QF.
Hon. General Secretary :	P. A. SOKOLOFF	4, Steep Close, Orpington, Kent. BR6 6DS.
Hon. Bulletin Editor :	B. O. C. GARDINER	c/o ARC Unit, Dept. of Zoology, Downing Street, Cambridge.
Hon. General Editor :	P. W. CRIBB	355, Hounslow Road, Hanworth, Feltham, Middx.
Hon. Treasurer :	R. A. FRY	8 Heather Close, New Haw, Weybridge, Surrey KT15 3PF.
Registrar	Wendy KEEN (Mrs)	8, Heather Close, New Haw, Weybridge, Surrey, KT15 3PF.

where to write

Subscription renewals (£3.00 p.a. or £2.00 under 18) :	B. R. STALLWOOD , 7 Markhall Close, Cheriton, Alresford, Hants. SO24 0QF.
First subscriptions, (£3.50 or £2.50 under 18), changes of address, non-arrival of Bulletins, membership applications and records :	REGISTRAR Address in list above
Manuscripts, drawings and Books for review :	B. O. C. GARDINER , Address in list above.
Advertisers :	R. D. HILLIARD , 18 Golf Close, Stanmore, Middx. HA7 2PP. (01-954 0460)
Exhibition matters :	B. F. SKINNER , 5 Rawlins Close, South Croydon, Surrey, CR2 8JS.
General enquiries :	P. A. SOKOLOFF , Address in list above.
J.C.C.B.I. representative :	D. KEEN , 3 Woodbourne, Farnham, Surrey, GU9 9EF.
A.E.S. Conservation Group :	D. LONSDALE , Forest Res. Stn., Alice Holt Lodge, Wrecclesham, Farnham, Surrey, GU10 4LH.
A.E.S. Exotic Insects Group :	C. J. ESCHBACHER , 38 Frith Road, Bognor Regis, Sussex, PO21 5LL.
A.E.S. Insect Behaviour and Ants Study Group :	M. M. PARSONS , 95 Glebe Lane, Barming, Maidstone, Kent, ME16 9BA.

The Observer's Book of CATERPILLARS

By David J. Carter

Illustrated by

Gordon Riley

This pocket guide deals with the more common species found in the British Isles and also includes some which are more scarce but of special interest. Over 200 species are described with details of food plants, distribution and life histories. The Introduction gives a general outline of caterpillar biology and notes on collecting and conservation. 226 colour illustrations and line drawings.

£1.50 *net*.

Frederick Warne

Warne House Vincent Lane

Dorking Surrey RH4 3FW

Official Publications Agent

L. CHRISTIE

HAS MOVED TO

129 FRANCISCAN ROAD,

TOOTING, LONDON,

SW17 8DZ

(Postal business only)

**Members of the Entomological
Suppliers Association.**

PUPA DIGGING

By the Rev. JOSEPH GREENE, M.A.

1857

Facsimile Reprint with a New Introduction

By E. W. CLASSEY

1979

Classica Entomologica No. 5

Price £1.50

This celebrated and rare booklet made famous the name of "Parson Greene". Although often quoted in the literature very few entomologists will have seen this delightful item.

From the Publisher

E. W. CLASSEY LTD.

PARK ROAD, FARINDON, OXON. SN7 7DR

Or any reputable Bookseller.

Member
of the
Entomological
Suppliers'
Association



Worldwide Butterflies Ltd

Open to Visitors Daily 10 - 5 incl. weekends
APRIL TO OCTOBER

**BUTTERFLIES IN A STATELY HOME FLYING AND
BREEDING IN TROPICAL PALM HOUSE
AND NATURAL JUNGLE**

Collections from across the World

FREE CAR PARKS

REFRESHMENTS

BOOKS SPECIMENS EQUIPMENT LIVESTOCK

Situated on A30 Sherborne - Yeovil dual carriageway

Send stamped addressed envelope for price list of
livestock, Entomological equipment, Specimens and Books

Worldwide Butterflies Ltd.

Compton House, Sherborne, Dorset. Yeovil (0935) 4608



ANNUAL REPORTS FOR 1978

OF THE COUNCIL

Council is pleased to report that 1978 has been a successful year for the Society, and one of change in the areas of administration and the Annual Exhibition. Membership has continued to grow, and on 31st December, 1978 the Society had 1650 members, comprising 7 Honorary, 14 Life, 34 Affiliate, 1253 Ordinary and 342 Junior members. The Society enrolled 291 new members, reinstated 9 and lost 171 through death, resignation, non-payment of subscription or being struck from the role. This represents a net gain of 129 members only 24 short of the 1977 record.

The report for 1977 indicated that the Officers of the Society were no longer able to cope effectively with the workload generated by our buoyant membership. After much discussion, Council appointed a part-time registrar, Mrs. B. W. Keen, on 1st September 1978 to handle the routine administration associated with enrolment, membership records, Bulletin envelopes, and other tasks. Experience so far suggests that this step has been worthwhile, and Council would like to extend its thanks to Mrs. Keen for her efficient and enthusiastic approach to the task.

Four issues of the Bulletin were published in 1978 under the Editorship of Mr. B. O. C. Gardiner, containing a record 216 pages of text and numerous illustrations. No new publications were launched this year, but considerable effort has gone into a major new venture, the "Dipterists' Handbook". Due to technical difficulties, it was not possible to publish until spring 1979. A new membership list was issued in November, and it is hoped that it will remain current for four years, subject to annual supplements.

Council met on six occasions during the year, and the A.G.M. was held at Caxton Hall in April, presided over by Mr. Gardiner, who also gave an interesting talk entitled "Feeding Insects from the Deep Freeze", illustrated by slides and larvae feeding on a variety of artificial diets.

The Annual Exhibition this year was held at Wembley Conference Centre—a comfortable and spacious venue. The more ambitious scale of the Exhibition was a success, and a full report appeared in the May Bulletin. The Council intends to continue with larger Exhibitions, but in the slightly less luxurious setting of The Alexandra Palace.

The Society still supports three study groups. The Exotic Entomology Group has maintained its membership at 221 and has produced four substantial newsletters, Mr. B. Morris taking over as Editor during the year. The Conservation Group has 43 paid members, a decrease over 1977. Council hopes that this does not reflect a decreasing interest in insect conservation. The Insect Behaviour and Ant Study Group has been revived jointly by Mr. M. Parsons and Mr. H. Lee. Although membership at present is only 15, the Group has produced three newsletters, and hopes to hold a field meeting during 1979.

Mr. G. Prior and Mr. V. Shearer retired from Council during 1978, Mr. Shearer continuing to edit the Wants and Exchanges List. Both members have given many years of service to the Society and Council extends its thanks to them. Council reports, with much regret, the deaths of three past Presidents of the Society: Mr. D. Ollevant was President in 1961, 1964 and 1965, held the Office of Hon. Secretary from 1954-1961, and youth Secretary from 1971-1976. Mr. P. Le Masurier was President in 1954, and held the Office of Hon. Treasurer from 1948 to 1959. Mr. L. W. Siggs was President in 1953, and held the Office of Advertising Secretary from 1951 to 1957. Other deaths this year include L. Waddington, J. Martin, C. F. Wilding, H. Lyons and C. Vaughan-Williams.

P. A. Sokoloff
Honorary Secretary

OF THE TREASURER

In my last Report I warned members that 1978 was likely to be financially a difficult year—and so it has proved. The Society's Income and Expenditure Account suffered a deficit of £739 which has reduced the reserves in the General Fund to £2122 or roughly the same level as three years ago. The Publications Trading Account recorded another healthy but much needed trading surplus of £795 with the Publications Fund now standing at £7077. Meanwhile the Study Groups' finances reflected those of the parent Society, all three Groups suffering deficits totalling £90 which reduced the balance of their combined Fund to a mere £127.

Looking at the Income and Expenditure Account, it is perhaps surprising that the deficit was not larger. An ambitious Bulletin schedule, combined with inflationary price increases in the printing industry raised our Bulletin costs by £790—nearly a third of their 1977 level—and although we raised the pagination and print order of Bulletins by 8%, the increase in printing costs of 27% was a factor which Council will need to watch very carefully, especially as this is the Society's biggest single item of regular expenditure. Two exceptional items in 1978 were the outlay of £522 on a fully reprinted Membership List, which will not

be repeated for another three years, and the costs associated with the appointment of a part-time Registrar (paid by the Society) which is now saving both time and effort in servicing our rapidly growing membership. On the credit side, subscription income and donations increased and there was a small bonus through the introduction in mid-year of enrolment fees for new members. Investment income and advertising revenue were both increased and the 1978 Exhibition, with a net surplus of £77, showed that our fears that it would prove costly were misplaced. In all, general income increased by £459 compared with 1977—an encouraging note in what was otherwise a very expensive year.

Little needs to be said about the Publications Trading Account since there were no new publications to finance and sales of existing titles amounting to £2364, while not quite so high as in 1977, were still very satisfactory. By year end the Society was awaiting from the printers of the first copies of "A Dipterist's Handbook" on which we are committing nearly £4,600 with grants and loans amounting to £2000 towards that figure generously approved by the Royal Society and the Nature Conservancy Council. We are extremely grateful for this outside assistance is the largest single publishing project in the Society's history to date.

Turning to our Balance Sheet, we have added a second typewriter to the list of office equipment which is the Society's only form of fixed asset. There was a reallocation of investments within the General Fund; the reserves held in the Life Membership and Ansorge Award Funds have been increased through additional purchases of long dated Government stock and Charifund units respectively, and other changes have been the redemption of the local authority loan and the opening of a National Savings Investment Account, which proved very useful. At the year end substantial payments were covered by equally substantial cash balances.

In November increases in subscription rates were announced in my annual letter to members for 1979. If these are found acceptable to the vast majority of members (as previous increases in 1973 and 1976 have been), we can look forward to greatly improved financial fortunes in the coming year. The absence of any exceptional expenditure coupled with careful control of Bulletin costs and the further development of our various sources of revenue should see a substantial restoration of our General Fund reserves. For me, that will be a suitable legacy to leave to whoever will take my place as your Treasurer. After presiding over the financial affairs of this Society for seven years and having watched its astonishing progress in that time under the management of a Council on which it has been a pleasure to serve, I remain confident that the immediate future of the Society has never been brighter.

N. H. Cooke
Honorary Treasurer

BALANCE SHEET AT 31st DECEMBER, 1978

1977		1978		1977		1978	
£	£	£	£	£	£	£	£
Balance of Fund:				Fixed Assets:			
2598	...	2861	...	Office Equipment,	...	465	...
263	...	—	...	at cost ...	...	...	...
2861	...	739	2122	Less: Depreciation	...	272	193
305	...	527	...	to date ...	...	...	...
100	...	153	...	Investments: at cost			
Life Membership Fund				£1066.78 Treasury 9%	...	984	...
Ansorge Award Fund				Convertible 1980	...	500	...
Creditors:				£561.07 Treasury 8½%	...	240	...
991	...	991	...	1980/82	...	240	...
171	...	80	...	£255.48 Treasury 12¼%	...	150	...
66	...	1448	...	1995	...	—	...
1234	...	£2519	...	£272.22 Treasury 9½%	...	1103	...
				1998	...	3317	...
				109 M&G Charifund	...	...	...
				income units	...	...	...
				Thurrock Council 10%	...	...	...
				loan bond	...	...	...
				National Savings	...	...	...
				Investment 9%	...	...	...
				2364	...	...	...
				Current Assets:			
				Stocks, at cost	...	99	...
				Sundry Debtors	...	290	...
				Income Tax Recoverable	...	57	...
				Cash at Bank: Deposit	...	—	...
				Current	...	1415	...
				Cash in hand	...	50	...
				1996	...	...	...
				£4500	...	£5321	...
				£4500	...	£5321	...

INCOME AND EXPENDITURE ACCOUNT for the Year Ended 31st December, 1978

EXPENDITURE		1978	1977	INCOME	
1977	£	£	£	£	£
Bulletin Costs:					
28	Editorial ...	58	2138	Subscriptions:	2394
1784	Printing ...	2281	325	Ordinary & Affiliate	377
662	Despatch ...	947	12	Junior ...	23
78	Indices ...	56		Life Membership Fund	2794
		3342			
Membership Services:					
120	Membership List	522	376	Donations ...	462
28	Wants/Exchange Lists	57	—	Enrolment Fees ...	26
		579		Investment Incomes (gross):	
Administration:					
180	Stationery & Notices	188	169	Dividends etc. ...	169
108	Postage & Carriage	121	—	National Savings Interest	102
—	Registrar's Fees	170	59	Bank deposit interest ...	16
92	Meetings expenses	96			287
25	Study Groups Support	—		Other Income (net):	
15	Depreciation ...	21	170	Advertising revenue ...	231
23	Insurance ...	32	162	Annual Exhibition ...	77
61	Sundry expenses	116	56	Badges & Tie Pins ...	49
		744			357
		—	3467		3926
3204		4665		SURPLUS EXPENDITURE, to	
263	Surplus Income (1977) to	—		General Fund ...	739
£3467	General Fund ...	£4665	£3467		£4665

PUBLICATIONS TRADING ACCOUNT **for the Year Ended 31st December, 1978**

New and Revised Publications Costs:			
£		£	£
6	Editorial ...	4	2552
1268	Printing ...	—	Sales (gross) ...
		4	...
838	Selling & Other Expenses ...	1019	Increase in value of stocks
—	Decrease in value of Stocks ...	546	...
2212		1569	...
1000	TRADING SURPLUS to Publications Fund ...	795	
£3212		£2364	
			£2364

N. H. COOKE Hon. Treasurer

The Report of the Auditors to the Members of the Amateur Entomologists' Society

We have examined the records of the Amateur Entomologists' Society, and in our opinion the Balance Sheet gives a true and fair view of the state of affairs on 31st December, 1978 and of the Income and Expenditure for the year ended on that date.

26th March, 1979.

L. G. WHITING
A. C. WOOD

OF THE EXOTIC ENTOMOLOGY GROUP

By the end of 1978 Group Membership had reached 221 of whom 151 were full members and 70 subscribers.

Membership fees for 1979 have kept at the original rate of £1.00 for subscribers and 50p for AES members—that is the rate at which we started when the Group was taken over by Dave Moon in the early 1970's.

With a total expenditure of £333.60 for the year, and income from membership fees of £145.50, it will be appreciated that we rely heavily on donations for our survival, and it will be necessary to increase our fees for 1980 to a more realistic level.

Four newsletters were produced again, and these together with distribution were our only items of expenditure.

In the middle of June, Brian Morris kindly took over the Editorship of the Newsletter and has produced some new and stimulating ideas for our future. The accent of the Groups' activities is still centred around exotic *livestock* and there have been several new and interesting species 'doing the rounds' recently. The Annual 'get together' took place in May, again kindly hosted by Robert Goodden at Worldwide Butterflies Ltd., Sherbourne. We are hoping to arrange a winter meeting as well in the near future.

Chris Eschbacher
Secretary and Treasurer

OF THE INSECT BEHAVIOUR AND ANT STUDY GROUP

We ended 1977 with a total membership of 22. Unfortunately the acting Treasurer/Secretary/Editor, due to pressure of work, had to leave the running of the group to someone else. I offered to become group secretary and soon afterwards Howard Lee offered to take up the Editorship so we started a quarter of the way through the year.

From 31st December 1978 till the time Howard Lee and myself took over eleven of the members left the group. We battled on with only eleven members until about June when we started to become a centre of attraction. I received quite a few letters of enquiry and also one or two new members were enrolled. Since that time we have been acquiring other new members. We now have a membership of 15. In 1978 we produced a total of 3 newsletters. Maybe not as thick as they should be but it is solely up to the members and they are contributing, which I am very pleased to see. From the first of January 1979 two systems have been introduced. A referencing system that gives not only the member's reference number but also his position in the world as far as group field meetings are concerned. A remittance advice system has also been introduced. There will be a field meeting held this year and as there are so few members of the A.E.S.I.B.A.S.G. in the southern area we have

decided to officially invite our mother society members to join in. It will be held on a Sunday at the Bedgebury Pinetum sometime in June. Any of you who are interested please contact me. My address is on the front cover of the A.E.S. bulletin.

At the present our future looks very bright both financially and membership wise.

M. M. Parsons
Group Secretary

OF THE SOCIETY'S REPRESENTATIVE ON THE JOINT COMMITTEE FOR THE CONSERVATION OF BRITISH INSECTS

The committee met twice during 1978 in London. The first meeting, in April was attended by Nicholas Cooke, our representative at that time. In the summer Mr. Cooke moved to Scotland and I replaced him as your representative on the Committee. I should, therefore, have attended the meeting in October, but, due to unforeseen business pressures I was otherwise engaged at that time. My thanks are due, therefore, to Dr. David Lonsdale who attended the second meeting on my behalf, at very short notice.

As in the past, the committee has spent a lot of time considering matters of administration and less on true entomological subjects. The sub-committee which was set up during the previous year has not made the impact that was hoped. There are several reasons for this, including the basic problem of finding a convenient time and place for the various members to get together. I am sure, also, that Mr. Cooke's resignation has left a very considerable gulf that will be difficult to fill. There are, you will be pleased to know, various ideas in the embryo stage which we hope to introduce next year to help to bring about the reforms we all consider so necessary.

A proposed exhibit at the Society's exhibition in Wembley did not, unfortunately, materialize due to the lack of available manpower to prepare and exhibit it.

On the subject of Legislation, the committee has been kept informed of the progress, or otherwise, of Lord Cranbrook's Bill. Whilst the committee will continue to bring as much pressure as possible to bring about amendments to this Bill it will not formally oppose it. Dr. Jerry Thomas has joined the committee as Surveys Officer. He has been very active in co-ordinating the work of a three-man team established under the Manpower Services Commission (job creation). This has been centred on Furzebrook and has investigated the status of the Marsh Fritillary, Small Blue, Adonis Blue, Purple Emperor, Silver-spotted Skipper and Lulworth Skipper in Dorset and the surrounding areas. This has been very successful, with several new records being made. A study of surveying methods has also been made which, it is hoped, will be

applicable to future surveys of Lepidoptera and other Orders. There is, at the present time, concern over the future of this work due to lack of finance.

The Nature Conservancy Council have made several new entomological staff appointments during the year. Several surveys have been commenced, including an investigation of Dragonfly breeding sites in Scotland. It is a pity that lack of finance in the future may reduce the effectiveness of this work.

Rare species—The NCC has investigated the status of the Essex Emerald and found the numbers to be very low. This species is in need of immediate protection and the Conservancy are doing what they can to achieve this.

A great deal of work is involved in maintaining the Large Copper at Woodwalton Fen. As the Warden will soon be retiring the NCC will have to consider very shortly if this work should be continued.

The committee has actively pursued the indiscriminate use of the "Flowtron" and other insect-killing devices. Some success has been achieved but, it seems, that the commercial interests still hold the upper hand at present. We are, however, taking action where we can and hope to register more success as time goes by.

Little information about species or sites being endangered appears to filter through to the committee. There have been several instances where this information has arrived too late, for example the spraying of aspens at Ham Street. It is a pity, therefore, that the county correspondents continue to remain silent. There is, of course, one fundamental problem to overcome and that is the fact that the average entomologist is normally a loner who rarely divulges information to anyone other than his closest friends. I feel, therefore, that it is most important for the JCCBI to publicise its functions far more widely than it has done in the past.

I hope that at this time next year I will be able to report that more progress has been made than I can at the present time.

In closing this report I wish to record my thanks for the considerable help that has been extended by Nicholas Cooke and other members of the A.E.S. Conservation Committee. On your behalf, I would also like to thank Mr. Cooke for the tremendous amount of work that he has put in on our behalf during the time he was our Representative on this committee.

D. H. R. Keen

ESSEX EMERALD MOTH TO BE PROTECTED

29 March 1979

A rare species of moth—the Essex Emerald Moth—will be statutorily protected under an order signed by Peter Shore, Secretary of State for the Environment. The Secretary of State's decision follows representa-

tions by the Nature Conservancy Council arguing that the species was so endangered that it should be given statutory protection by inclusion in Schedule 1 of the Conservation of Wild Creatures and Wild Plants Act 1975.

The effect of the order is that it will be an offence for anyone to kill, injure or take any part or specimen. The offence is punishable by a fine of up to £100 for each individual specimen.

The order comes into effect immediately and applies to England and Wales. The species is unlikely to occur in Scotland.

The Essex Emerald Moth is dependent on a food plant found in Essex and Kent and there is strong evidence that the moth has been taken regularly by collectors in recent years, even though the population was known to be very depleted. As a result, between 1976 and 1978 the species was thought to be extinct. However, a survey undertaken last autumn by the NCC revealed the existence of a surviving population of approximately twenty larvae on a single site of only some five square yards.

Editorial note:—The above is Press Notice No. 147 issued by the Department of the Environment and is printed as received. Your editor would like the opinion, with evidence, if any, of members who consider over-collecting to be the cause of its depletion. With recollections of immediate postwar collecting, in areas now covered with vast tank farms, he personally feels the cause of the Emerald's depletion can be laid fair and square at the hands of the planning authorities who have permitted such vast destruction of its habitats.

MITE THREATENS BEES

Bee keepers are seriously concerned at the possible spread into this country of the mite *Varroa jacobsoni* which parasitises both the adult and juvenile stages of the honey bee. During recent years the mite has spread rapidly from the Far East and has now reached South America and West Germany. Since the mite spreads solely through the movement of bees either naturally, or artificially through bee-keepers management, it is most important that there is a control on imported bees into this country. The British Bee-Keepers Association requested MAFF to impose a total ban on the import of bees and queens for an initial period of one year but as the law stands at present this is impossible. However, a temporary ban can be imposed and MAFF have promised to introduce this for package and comb bees, and for Queens and attendant workers from countries where *Varroa* is known to be present. They also intend to lay a Bill before Parliament which will give them power to impose a total ban. It should be noted that *Varroa* is difficult to detect in the early stages of infection, even by microscopical examination and at present there is *NO* known cure or treatment. Further details may be obtained from Mr. Meyer, General Secretary of the British Bee-Keepers Associa-

tion, 55 Chipstead Lane, Sevenoaks, Kent TN13 2AJ or from Dr. E. Crane, International Bee Research Association, Hill House, Gerrards Cross, Bucks., SL9 0NR (s.a.e. please).

Habitat

ECOLOGICAL PARKS TRUST

We are pleased to bring this trust to the notice of our members and welcome their kind invitation to visit, by appointment, one of their properties, appropriately named the William Curtis Ecological Park, 16 Vine Lane, London, SE1 2JQ. Mr. Jeremy Cotton, the Warden Naturalist, has given us the following details.

The Ecological Parks Trust is a charitable trust largely dependent on people working in their spare time and we manage the William Curtis Ecological Park. This site (address above) is separated from Vine Lane, a turning off Tooley Street on the south side of the Thames between London Bridge and Tower Bridge, by a small lorry park across which we have access. Entrance to the lorry park is opposite the Anchor Butter factory in Vine Lane. It consists of two acres of a former lorry park, covered with clay subsoil and planted with grass and trees as part of the Queen's Silver Jubilee celebrations, contains a 500 m² pond and some areas of pre-existing vegetation.

It was officially opened in May 1977; 208 species of vascular plant were recorded in 1977 and 280 in 1978. Insect colonisation has been rapid, but the insect species and populations have not been properly covered; some groups hardly covered at all. Some lecturers, etc., working locally appreciate the chance to drop in for some field entomology in spare moments. Any members of your society interested in building up species lists, a reference collection for the park, or investigating populations would be very welcome. Members living or working in the City, Tower Hamlets, or North Southwark should find it possible to visit us during the lunch hour, in the evening, or at weekends, and have a change from their usual habitat. Members using London Bridge Station for commuting may find it worth visiting us on a summer evening, thus avoiding the worst of the rush hour.

Anyone contemplating a first visit is advised to ring me on one of the numbers given below first;

- (i) to confirm exact directions for finding the park.
- (ii) to ensure that we are expecting them—the gate to the Vine Lane Lorry Park is often locked in the evening, but we keep it open when visitors are expected.
- (iii) to ensure that a suitably qualified member of staff is present. The full time wardens should be able to identify insect orders, and hopefully families, and be able to show the best areas of the park for groups of particular interest to a visitor.

Mr. Cotton's phone number is:

01-403-2078 (Park) or 01-858-3903 (Home).

BOOK REVIEWS

Conservation and Agriculture edited by Joan Davidson and Richard Lloyd. Published by Wiley and Sons. Price £12.

The modern trend towards large fields, maximum yields, removal of non-agricultural habitats and the widespread use of sprays has caused concern over the future of the farmed countryside—in total some 80% of the British Isles. In this book, the editors have drawn together much of what is known about agriculture and the role of conservation in its practice. A comprehensive list of contributors brings expertise in all related topics such as voluntary action, agricultural change, statutory controls and incentives as well as chapters looking at each broad habitat type—arable, wetlands, lowland grasslands and hill pasture. Although many of these facts have been published elsewhere it is useful to have them all presented in one place as this book more or less forms a first reference for those interested in the possibilities for conservation on agricultural land.

Habitat

Trichoptera: Hydroptilidae, by Jane E. Marshall. Handbooks for the Identification of British Insects, Vol. I, Part 14(a). Royal Entomological Society of London, 1978, 31pp. Price £3.30.

The lesser orders of insects are receiving increasing attention, but, amongst the caddis-flies, the Hydroptilidae are relatively poorly known. The number of species on the British list continues to grow—McLachlan in 1880 in his monograph on the group referred to only 13 species as known from the U.K.; by 1939, Mosely in 'British Caddis Flies', could list 27; Macan, in 'Key to the Adults of the British Trichoptera', included 29 species; and now Miss Marshall gives 31 species on the British list, the two latest additions being species which she had already reported in 1977, one new to science and the other previously known from the Swiss and French Alps.

As Miss Marshall indicates, much still remains to be discovered—other species (perhaps *Agraylea cognatella*, McL., for example) may yet be found to occur in the U.K.; of some species only one sex is known *Hydroptila tigurina*, Ris, is said by Miss Marshall in this Handbook to be known only from two collections of male specimens, from Ambleside and from Zurich; (Mosely's reference to numerous specimens being in J. J. F. X. King's collection, all from Northern Scotland, is now believed to be erroneous); the larvae of only 20 of the British species have been described in reasonable, but variable, detail—Miss Marshall gives a key for larvae to genera but not to species; and many aspects of life-history and ecology have still to be resolved.

The identification of Hydroptilidae is heavily dependent upon examination of genitalia, and the adults are generally better stored in alcohol than pinned and dry. Miss Marshall provides excellent drawings of the

genitalia, which are both detailed and also reliable in the light of modern knowledge, whereas previous authors have provided over-simplified drawings which were sometimes misidentified.

Although this Handbook is of only 31 pages, it is well condensed and crammed with accurate, efficient and up-to-date information to provide a taxonomic guide to the British Hydroptilids. It well maintains the traditions and reputations of the Royal Entomological Society of London's series for the identification of British insects, with rather greater attention than in some of the other handbooks of the series to such aspects as the biology, the world distribution in general terms, and the relationships of the Hydroptilidae.

W. R. B. Hynd

Invertebrate Rearer's Handbook. 14 pp plus 2pp line drawings. A5 (folded paper), Simon Ellis, 1978. Price 45p.

A small publication described as an "up-to-date culture guide to the most popular invertebrates available to date", which attempts to outline the techniques for rearing stick and leaf insects, mantids, snails, millipedes, centipedes, scorpions, spiders and exotic lepidoptera. Some of the hints given, for example on rearing Phasmids, are very useful. Others vary from hopeless to DANGEROUS. The statement "... they can be picked up by the tail but it is safer and kinder to the Scorpion to use a jar . . ." should never have appeared in a publication likely to be read by young or novice entomologists. Scorpions can be picked up by the tail, *but only when using long tweezers*. Any attempt to use fingers is foolhardy.

Spelling and grammatical errors abound. We can breed "Birowings" and use "Asclapias" as a foodplant. However, the thought behind this publication is sound—an inexpensive leaflet on rearing the various exotica now available is much needed, but this attempt is spoiled by inconsistent presentation and an apparent absence of proof reading. A bibliography of title only is not very useful, but becomes suspect when all further enquiries are referred to a specific dealer.

Paul Sokoloff

The coloration, identification and phylogeny of Nessaea butterflies (Lepidoptera: Nymphalidae) by R. I. Vane-Wright. Bulletin of the British Museum (Natural History) Vol. 38 pp. 29-56; 1 cold plate 4to. 1979. Price £3.75.

Here is a revision of a genus of South American butterflies that hits us like a breath of fresh air on a sultry day. No longer do we have nothing but the precise listing of setae and mathematical analyses of intersegmental ratios. Here we have a reasoned account not only of the obvious specific differences but also of the why's and wherefore's of why and how the colour differences of the wings exist, and the effect of geographical variation and—what is so often completely ignored in taxonomic work—

an account and assessment of such of the early stages as are at present known. In particular the chemical basis of the colour is defined and the use to which the butterflies put this colour, and hence how the species have derived from a common ancestor.

For a comparatively short paper the more than two pages of references is impressive and clearly indicates the depth to which the author has studied the subject, and form a most useful basis for those intending future studies along similar lines.

The colour plate of the *Nessaëa* adults is of very high quality and the black and white illustrations and diagrams are also well-produced and informative.

This booklet should be in the hands of all those wishing to be *au fait* with modern concepts of taxonomy.

B.O.C.G.

Fenland: its ancient past and uncertain future by Sir Harry Godwin. Published by Cambridge University Press 1978. 196 pages. Black and white plates. Price £7.95.

To many the landscape of the fens is an acquired taste, but the author conveys from the outset his appreciation of both their haunting quality and rich ecological character. By providing a detailed background to the ecological history of the area and an outline of the pollen analyses undertaken there from 1931 onwards a detailed picture of fen succession controlled largely by a major rise in ocean level and subsequent movements of land and sea is explained. Giant trees, for example, have been found in large numbers during peat cutting and drainage, among which are oaks, yews and pines; a paradox in relation to the now treeless landscape of the fens. Interspersed with the ecological history are references to the archaeological finds including artefacts, pottery and bones, as well as fossil flora and fauna. One of the most interesting discoveries is of a complete skeleton of a wild ox *Bos primigenius*, which was found with a hole smashed through the front of the skull. Beside it lay a polished stone axe used by a Neolithic man to defeat his quarry. The wide ranging review of the land use history is fascinating and chapters are included on peat winning, ancient crops, land drainage and other subjects of interest. The last chapter is devoted to a survey of the lost and vanishing species in the fen habitat due in the main to the long history of drainage activities which were intensified from the seventeenth century onwards. Besides aurochs the fens can also boast of abundant wild boar, wolf, bear, elk and beaver in the past. The fen flora has suffered more particularly from drainage effects—broomrape, *Orobanche ramosa* has disappeared together with marsh fleawort *Senecio palustris*; while water soldier, white flowered frog bit and the bog bean have decreased in numbers. The decline and extinction of the Swallow tail butterfly is linked with a decrease in the abundance of the host plant, milk parsley. Regrettably, reintroduction of the Swallow tail

in recent years has not been the success hoped for. Fortunately a number of nature reserves have been established, for example, at Wicken Fen, Holme Fen and Woodwalton Fen all of which are managed for conservation as examples of fast disappearing fen habitat.

This book is thoroughly recommended to the historical ecologist, archaeologist and the general reader.

Habitat

SOME OBSERVATIONS ON THE PINE PROCESSIONARY MOTH

A recent article in the Sunday Express referring to a 'plague' of caterpillars in Majorca, obviously referring to the Pine Processionary, prompted me to look into the life-histories of this interesting group of moths, and into that of the above species in particular, having met with it in SW France.

There are three European species, *Thaumetopoea processionea* L. which feeds on oak and builds large nests on the tree-trunks; *T. pityocampa* L. which infests trees of the *Pinus* genus, building somewhat smaller nests on the terminal foliage, and *T. pinivora* Treitschke, which is only distinguished from *pityocampa* in the larval state, which is addicted to *Pinus sylvestris* and *P. pinea*. This latter species is said to build nests in sand at the foot of trees.

The life-histories of *processionea* and *pityocampa* are somewhat similar, but there are points of difference. Eggs are laid by both species in July and August and the newly hatched larvae spin large communal nests, those of *pityocampa* being divided into chambers, whereas those of *processionea* are not. The resultant larvae spend the winter in the nest, emerging to feed whenever the weather is suitable. In March the colonies break up, *pityocampa* pupating below ground and *processionea* in cocoons within the nest. The moths emerge in late June and the cycle begins again.

The "processionary" habits of the larvae, well-known to most entomologists vary between the species, *pityocampa* and *pinivora* travelling in single line while *processionea* moves in shorter triangular groups with a single larva at the apex following by increasing numbers side by side. The larvae are evening or night feeders, rarely doing so before sunset. All three species are European but do not occur in the British Isles.

My own observations are limited to *pityocampa* in the Gironde département of SW France. In 1964, trees of Maritime Pine (*Pinus pinaster*), were covered with old nests, but the larvae had all gone down to pupate. This was during the first two weeks of June. In 1970, however, at the same locality, but later (21st June—4th July), the adults were abundant flying by both day and night. Their flight was very poor and many were found to be crippled or otherwise deformed and could be easily caught by hand.

In an earlier article (Stallwood 1975) I mentioned the striking resem-

blance these moths had to the winged seeds of the Maritime Pine. The tree bears very large cones and when ripe the winged seeds fall in a similar manner to the sycamore, usually at about an angle of 45 degrees. The moths also flutter to the ground from the trees at the same angle and it is difficult to tell the difference at first glance. As I said in the article referred to "It raises the query as to a possible form of protection" or mimicry. The moths are extremely vulnerable and the area is heavily populated with birds such as redstarts, tits, tree-creepers etc., but whether the moth is edible I do not know. As to the malformations (which reminded me of the adult of the domestic silkworm moth) possibly they are the result of measures taken by the foresters, insecticides etc., but this is only a guess. Certainly *pityocampa* causes a great deal of trouble to the foresters of the area which is almost entirely devoted to the growing of timber. Various means of control have been tried, destroying the pests by fire (a dangerous procedure) spraying and even shooting with small shot. It is also said that the eggs can be destroyed with paraffin, but this could be time consuming as the moth oviposits on the terminal foliage and not always low down.

Enemies

Although Reed (1954) says *pityocampa* has no natural enemies, Spicer (1871) mentions the larvae of the beetle *Calosoma sycophanta* L. (Carabidae) which, he says, prey on the caterpillars voraciously, and Brangham (1962) refers to another predator, the Silphid beetle *Xylodrepa quadripunctata* Schreber, in addition to *sycophanta*, as well as the Cuckoo, which is well known to have a liking for hairy larvae.

Poisonous hairs

Processionary larvae are clothed with urticating hairs similar to the Gold-tails and Brown-tails in Britain. Spicer (1871) gives a somewhat lurid description in typical mid-19th century style on the effect of these poisonous hairs on humans and animals:—

"Woe to the person who incautiously meddles with one of the nests or picks up a caterpillar. No sooner do these poisonous hairs come in contact with the surface of the body, than they produce an itching sensation, followed by inflammation more or less severe according to the state of the victim and the condition of the atmosphere . . ." Then follows instructions to anoint the body with oil, or "envelope the body in oiled linen . . ." etc. if it is necessary to come into contact with the insects. Apparently nests as well as larvae (dead or alive) are dangerous from this point of view, but I must admit I have handled empty nests and camped among trees covered with them, without harm.

Plagues of caterpillars

Like some other insects, the Processionaries have periods of extreme abundance:—

In 1865, there was a plague of *T. processionea* in the Bois de Boulogne

when it was necessary to close many parts of the woods to the public (Spicer 1871), and according to Reed (1954) in the spring of 1941 an invasion of *pityocampa* larvae occurred on the Brittany coast "entering houses, eating curtains and other fibrous material." A similar occurrence of millions of *pityocampa* larvae eating their way through the pinewoods in Majorca in March 1978 is reported by Horsfall (1978), here again invading properties, and despite counter measures scores of trees have died.

It is interesting to note that a British notodontid, the Buff Tip, (*Phalera bucephala*) although not a processionary, has the habit, in the early larval state of resting side by side in herringbone formation on the underside of leaves.

B. R. Stallwood (1547)

REFERENCES

- BRANGHAM, A. N. (1962) The Naturalist's Riviera 72-3 (Phoenix House, Lond.)
 KIRBY, W. F. (1903) Butterflies & Moths of Europe 141 (Cassell Lond.)
 KLOTS, A. B. (1957) World of Butterflies & Moths 156 (Harrap Lond.)
 REED, J. L. (1954) Forests of France 264 (Faber & Faber Lond.)
 RENNIE, J. (1830) Insect Architecture 333 (C. Knight Lond.)
 HORSFALL, B. (1978) Sunday Express 26th March 1978.
 STALLWOOD, B. R. (1975) Observations on Butterflies of the Gironde Peninsula, *Bull. amat. Ent. Soc.* 34. 103.

A COLLECTING TRIP TO NIGERIA—1978

During the last year we were fortunate enough to be able to spend a month bug-hunting in West Africa between 13th July and 18th August. Our choice was Nigeria and we are hoping to have another trip this year. Our experiences are listed below and should give members a brief idea of what to expect.

13 July: We left England and arrived at Kano International Airport, in Northern Nigeria during the night. Since it had only recently stopped raining, we found it extremely humid, often English conditions!

14 July: We searched the compound we were staying in during the morning. We found only a wing of a Silkmoth, but plenty of Mantids, one of which had just moulted to become an adult. After lunch we started on our journey down to the South. En route we found a number of Silkmoth ova and larvae. We arrived at Panyam late at night. This was where we stayed for most of the time. It is situated on the Nigerian Plateau some 1,000 m above sea level.

15 July: Saw several Snakes, during our first true day of collecting at Panyam. We found several Mantids and a Stick insect. In the wooded area where the River ran through, and on the plain surrounding the area we found a large number of Butterfly species which include members of

the following groups:—*Papilio*, *Acraea*, *Nymphalis*, Browns, Skippers, Blues, Whites, *Charaxes* and Monarchs. There were also flying moths, and Syntomidae. On the Plateau, there was granite everywhere, and we were only a few minutes walk from steep rocky hills. The flowering lilies growing inside the Compound were frequented by numerous Hawkmoths at dusk.

16-21 July: During this period, we explored the area, collecting as we went. We tried out our Black lights with the use of a Portable Honda generator, but except for a Mantid, found it useless. Numerous Fire-flies could be seen on the Flamboyant trees in the evening, with their tiny but powerful flickering lights. We visited Wass where we found several interesting specimens. At Wass there is also a massive Volcanic plug, some 350 m high, of sheer rock. Near here we found Silkmoth larvae, who had stripped every Sheabutter tree for miles—in fact several hundred miles, as we later found it extending south of the River Benue. We found more interesting Silkmoth Larvae in Jos, which is the Plateau State capital.

22-26 July: Back at Panyam, we visited Lett pool—the area is very barren, and has very few trees. However we found a wandering *Alcinoe* larva, ready to pupate. Since it had no marks, and looked very fit, we felt sure that a bird had not accidentally dropped it and wondered on what it could have fed. Scorpions were under many stones we turned over and looked under not to mention the occasional Puff or Night adder! On the 24th we visited Mongu, and later the Leprosy settlement, where we again found some *B.alcinoe*—Many had pupated but we collected about 25. We were later to find out that they were parasitised—when massive Maggots came out, and proceeded to pupate! Even the Praying Mantids refused to eat these! We also visited Hidden valley—no one farmed here, and the grass was short and the butterflies plentiful. It was very beautiful. Later in the week we climbed Kerang—a Volcanic cone—where several interesting butterflies were to be found. However as soon as we were nearly on top, it poured with rain, and we were soaked. Next day we visited Ampang Volcano crater lake, where we spotted a Crocodile.

27 July: We crossed onto the south side of the River Benue. We went over the mile of water in a ferry which looked as though it were made when the first White man set foot—and felt like it! *Acraea* species were extremely common all around here, we could catch 20 in a sweep of a net.

28-31 July: Found some more Silkmoth larvae—these fed on Castor oil plant and were black with yellow spines. We visited Takkas river ford where we obtained many Scorpions and other insects on the Rocks nearby. Most of our Silkmoth larvae fed on Olive and Mango, as well as the normal food plants known to us.

B



D



A



C



1-2 August: On both these days, it rained very hard and the whole flood plain was flooded. With the risk of Snakes and Scorpions in the water, we waded out, and on the Sisal bushes found large numbers of Beetles, Mantids, and Stick insects. Well, anyway the frogs were at least happy, since they never stopped croaking!

3-4 August: Very wet still, but continued catching where we could.

5-9 August: We stayed in Jos for 5 days. During this time, we found around 200 assorted larvae. It rained very little, so was extremely good for butterflies. We caught several *Papilio* species, incl. *demodocus* and *dardanus*. These both lay well in small cages, and tend to lay everywhere in the same way Silkmoths do.

10-17 August: In the last week, for me at least, we saw numerous *Charaxes jasius* feeding on tree sap, released as a result of the activity of wood borers of one kind or another. *Danaus limniace* were very common. In the last few days we found a fresh area of flowers, where several species were found in vast numbers. These included the Painted lady, Danaids, Whites, Papilios, and we saw nearly 100 Bee and Hummingbird hawkmoths. We also saw some *Graphium* spp. This was all partly due to the recent sunny weather—a sign the dry season was coming very early.

18 August: Sadly, the day had come! I had to return to 'this place'! No problems at the Customs, and brought back a suitcase full of interesting insects.

We visited Nigeria during the rainy season, which is the best time for the collector, and since we were very high up, it was quite cool. It would usually rain every day—you would see the rain falling, and moving quickly across the skies. Although it may only last a few minutes, you would be soaked if you were out in it for a second. So you have to get the best shelter possible—even a large Banana leaf comes in useful!

Although the above are really but very brief notes for Entomologists, for those thinking of visiting Africa, you may be interested to know that Nigeria, is extremely settled and in 1979 the Military Government expect to hand the country over to Local government. Nigerians are very friendly, and always greet you. They do not hate Whites—such as in some parts of Africa, but will always help you. It is probably the best African country to visit.

At the time of writing I am planning for 1980 a trip to New Guinea—anyone interested and would like fuller details please get in touch. Our advice is never plan to collect on holidays in commercial centres, since you are unlikely to succeed.

Simon Ellis (5659) and Tim Joy

A Collecting trip to Nigeria. A, *Papilio phorcas*. B. Typical collecting area. C. *Danaus* species. D, *Danaus limniace*.

NOTES AND OBSERVATIONS

Rare Aberration in Sussex — On 9th May this year I was collecting late surviving hibernating Nymphalids from a wood near Goring-on-Sea. It was my delight to see a specimen of the Peacock, *Inachis io* L., settle, wings closed, on a footbridge over a stream. As I approached the butterfly, I was taken aback as it opened its wings. The eye-spots of the forewings were translated to the discal area, and the area thus vacated, extending to the apex of each forewing, was coloured sky-blue. The hindwings appeared normal. Attempted capture of the insect failed, but perhaps this was for the best—breeding may produce dozens similar to this later in the year.—R. Sinden (4860)

Hornets in Devon:—With reference to the article by B. R. Stallwood, in the Bulletin Vol. 38, No. 322 on his observations on the abundance and scarcity of the Hornet, *Vespa crabro* L. he mentions that his last sighting was in 1953.

My brother has sent me information on Hornets which he has observed on an Estate in South Devon. Since he went to live there in 1975 he has sighted approximately twenty Hornets in a building situated in a wood, each year for the past four years.

Approximately thirty were also recorded from an unidentified shrub on the Estate last Autumn. This also proved to attract large numbers of Common Wasps, *Vespula vulgaris* L. and many species of butterfly.

Unfortunately, we have been unable to discover a nest but a non-entomological local disclosed that he destroyed a nest last year in a different locality.

However, it seems that the numbers of Hornets observed this year so far have declined so it may be that this insect is undergoing a cycle of abundance and scarcity as Mr. Stallwood suggests.

It is interesting to note that Devon is the only place where I or my brother have observed Hornets.—Helen West (5880J)

Abundance of Holly Blues. — The long cold winter and late spring of 1979 has obviously suited the Holly blue butterfly (*Celastrina argiolus* L.) In Cambridge I have never seen it so common, both in the first and second generations. The second generation I also noticed to be very common in Somerset while I was there for a week's holiday.—Brian O. C. Gardiner (225)

Destruction of the Somerset Levels. — In spite of very strong objections by the Nature Conservancy Council, a grant has been made by another Government Department, that of Agriculture, to two individuals to enable them to drain and thereby totally destroy some 40 or more acres of some of the best land for wild-life and pasturage on Sedgemoor. All for the sake of, apparently, some quick grain cash-crops. The destruction of wild-life

and scenic beauty will be considerable. The more protest that can be made about this sort of thing in the right quarters, it seems to us, the better.—Editor.

A case of Sexual Dimorphism in the Buff-tip moth. — The Buff-tip moth (*P. bucephala* L.) is a very common and well known moth, whose existence is known to all entomologists, and whose dried and spreadeagled corpse is to be found in many collections of British Lepidoptera.

In 1963 Richard Ford described it as being somewhat like a cigarette end in colour when resting and all the descriptions that I have found show it to be an attractive, but ordinary largish moth.

During my recent researches into this species I have not been able to discover any mention of any form of sexual dimorphism and, indeed the only variant of the species about which I have read is a unique (?) chocolate coloured specimen which was caught by Mr H. D. Swaine and is now in the National collection. Apart from this single specimen there does not seem to be any markedly different variant from the norm in this species.

It was very much to my surprise that, when on a collecting ramble in the Yelverton district of Dartmoor on July 15th of last year that I saw two specimens of *P. bucephala* on a dock plant in the roadside. They were of markedly different sizes and the smaller of the two specimens was of a much drabber and paler colour.

I captured the specimens and they are now in my collection, somewhat the worse for wear unfortunately as they were in store for a while and have been partially attacked by mites.

I would be very interested to hear of any other such variations of *P. bucephala* and would like to know if this is a case of sexual dimorphism, an unusual variety of this moth, or merely a specimen of a different species which I have inadvertently confused with my specimen of *P. bucephala*!—J. O. N. Downes (6532)

THE CONTROL OF LARVAL COLOUR VARIATION IN THE ANGLESHADES MOTH (*PHLOGOPHORA METICULOSA* L.) AND SOME OF ITS CONSEQUENCES

PART 1: THE CONTROL

Introduction

Recently, I have completed a thesis on the control of larval colour variation in the Angleshades Moth (*Phlogophora meticulosa* L.). The object of this study was to look in depth into the causes and consequences of one of the most widespread types of larval variation, that is to say, the occurrence of green compared with brown or blackish colouring. Ford noted this occurrence in his book on Moths (1955), where he wrote:—“Such variation has been reported in a great many species widely scatter-

ed among the Lepidoptera. It is by no means fully understood, and has indeed never been subjected to the rigorous experiments which would be needed to interpret it".

Species with both green and brown larval forms are most common amongst the Noctuidae. Often both forms are approximately equal in abundance, as in the Broom Moth (*Ceramica pisi* L.), but in the Red Sword-grass (*Xylena vetusta* Hubn.), the brown form is scarce, while in the Large Yellow Underwing (*Noctua pronuba* L.), the green is the scarce form. The amount of work previously carried out on this phenomenon is scant, with the exception of Poulton's extensive studies, in the late nineteenth century, on the way in which larval coloration is influenced by surroundings. He used mainly arbivorous larvae of the Geometridae for his experiments and found that many species are very sensitive to the background colour of their immediate surroundings. The Brimstone Moth (*Opisthograptis luteolata* L.) and the Peppered Moth (*Biston betularia* L.), produced the most striking results. In general, larvae of both species bred amongst green leaves were of the green form, whilst those reared amongst brown twigs became brown. Larvae of other species which have a series of brown forms, but no green ones, were also found to be susceptible, the shade of the ground colour depending on the darkness of the twigs upon which the larvae rested.

Experiments on the sensitivity of Noctuid larvae are few and generally inconclusive. Poulton found no indication that any Noctuid larvae, apart from arbivorous larvae of the genus *Catocala*, were influenced by their surroundings. The larvae of many Noctuid species hide amongst low herbage during the day-time, and so the need for acquiring colours like those of their environment would appear to be less than in the case of arbivorous Geometrid larvae. Indeed, Cockayne (1928) indicates that he suspects that even in Geometrid species, there is an hereditary difference between green and brown forms, but that it can, to a large extent, be overcome by environment, whilst in the majority of Noctuids which have both forms, the variation is solely hereditary.

It is my intention in this article, to outline very briefly the work I carried out (without going into a detailed account of the experimental methods used, see Majerus 1978), in the hope of stimulating other Lepidoptera breeders to carry out similar work on other species. As Ford (1955) wrote:—"There are very few subjects in which the amateur can so easily and inexpensively make substantial contributions to scientific knowledge as in genetics, and particularly in the genetics of butterflies and moths. He can do so without disorganising his hobby or indeed very much extending it, even if his previous aim has merely been to amass a collection. He need only systemise his breeding of insects, keep his broods rigorously separate, and record his results accurately in the light of Mendel's laws and a few elementary extensions of them. Moreover, these are so simple that I have known a child of eleven to master them in an afternoon and successfully apply them, with help, to the combination

of different varieties of tame mice". Reference to basic genetic laws and their relevance will be found in Ford (1945, 1955).

The Moth

The Angleshades is a member of the sub-family Amphipyridae of the family Noctuidae. It is a medium sized moth with a wingspan of about 50 mm, its forewing ground colour is pinky-brown with a triangular central band of olive and the outer margin unevenly dentated. The hindwing is of a pale ochre-brown colour. When at rest, the wings are held along the body and are broadly wrinkled. In this position, the moth is very like a crumpled, decaying leaf and is undoubtedly cryptic. The imago varies little, although the olive colour may be replaced with red, and in such specimens, the ground colour is more rosy. The hindwing ground colour may also occasionally be suffused with dark grey scales.

The larva is eruciform, up to 40 mm long when in the 5th instar, and the colour varies from pale yellow through green and olive to dark brown. It is minutely dotted with white and a central line runs along the back. This may be interrupted and has dark v-shaped marks along each side of it, which vary in intensity, appearing in some cases to be totally absent. The lines along the sides of the larva connecting the dark ringed spiracles are usually whitish, but they may be tinged with the ground colour. Larval instars may be distinguished by measuring the width of the head capsule, or by measuring the overall body length.

There are normally five larval instars, but occasionally six instars are recorded, a situation which is possibly analagous to that of *A. gamma*, which may have five, six or seven larval instars (Long, 1953). The reason for the occurrence of an additional instar is not known.

The pupa is smooth in texture and chestnut brown in colour. It is surrounded by a thin silken web, either amongst the leaf debris at ground level, or just below the surface in light soil.

The moth comes readily to mercury-vapour light-traps and females taken in this way are virtually always fertile.

P. meticulousa does not have a rigid annual cycle and it may be found in all stages of development, during all seasons of the year. Generally, there seem to be two generations a year, although in abnormally warm years, (e.g. 1976), there may be three broods, and under optimum conditions in captivity, eight broods a year may be obtained. The adults occur most commonly during April and May, and again in September and October in normal years, but may be found in any month and egg-laying females have been taken in January and February.

The larvae feed mainly between dusk and dawn, spending the daylight hours amongst the herbage and debris close to the ground. They show no true winter diapause and will continue to be active throughout the year, when the temperature is above 4°C. The larvae are highly polyphagous, feeding mainly at night on the foliage of a very wide range of low

growing plants. In captivity, they may also eat the leaves of many deciduous trees as well as the flowers, seed-pods and stems of many plants, although they will not commonly do so in the wild. Personal observations have indicated that the favoured natural foodplants seem to be sorrels and docks (*Rumex spp.*) and plantains (*Plantago spp.*).

Larval colour analysis

Because of the extreme variation in larval colour in this species, (I know of no other British moth which exhibits greater larval ground colour variation), a consistent and reliable method of scoring larvae had to be developed so that the true nature of the variation could be determined. The method employed was to make up an extremely extensive colour chart, containing some 641 different colours, by mixing specific amounts of various green, yellow, brown, black and white paints, and then match the larvae by direct visual means with one of the colours. Any direct colour matching system obviously incorporates many errors, but these may be minimised by always scoring larvae under similar conditions.

To discover the nature of the variation within a population, a sample of 3,000 larvae was scored for ground colour with the following general results. In the first and second instars all larvae fed upon Common Sorrel, (*Rumex acetosa*) were green, whilst in the third and subsequent instars six distinct forms were identified, these being named; "Green, Olive, Brown, Plain Yellow, Yellow-green and Yellow-brown". The proportions of these colour-types in the third, fourth and fifth instars varied considerably, the three yellow colour-types being much rarer than any of the others. When a colour change occurred this always coincided with a larval ecdysis.

Experiments on the effect of environment on larval colour

A number of experiments were carried out to discover whether the environment affected larval colour variation. These experiments were designed to look into the effects of:—

- (a) low temperature (constantly $4\pm 1^{\circ}\text{C}$)
- (b) high temperature (constantly $25\pm 1^{\circ}\text{C}$)
- (c) low variable temperature (ranging from $4\pm 1^{\circ}\text{C}$ to $12\pm 1^{\circ}\text{C}$)
- (d) high variable temperature (ranging from $17\pm 1^{\circ}\text{C}$ to $25\pm 1^{\circ}\text{C}$)
- (e) rearing larvae at various larval densities
- (f) various background colours
- (g) varying the duration of light per day
- (h) varying light wavelength
- (i) feeding larvae on a range of foodplants

Of these factors, only the last, i.e. foodplant, had any appreciable effect on larval colour, and then only in the first three instars.

Initial experiments indicated that larvae fed on leaves of different shades of green almost invariably matched the leaf colour in the first and

second instars. In the third instar approximately 75% of larvae showed a similar response. However, some 3rd instar larvae, due, as I discovered later, to a genetic switch mechanism, showed no response. In the fourth and subsequent instars, larval colour was not affected by foodplant.

Because the larvae of the Angleshades are polyphagous, a wide range of natural foods of different colours could be fed to larvae to investigate the degree to which larval colour in the first and second instars is affected by foodplant. Samples of newly hatched larvae were fed on one or other of sixteen different coloured foodplant types. These were broom petals of two types (yellow, and partly yellow and partly deep magenta), rose petals of six colours, these being dark crimson, flame red, pink, pale pink, yellow-pink, and very pale pink-white, mauve rhododendron petals, two types of pansy petals (navy blue, and partly pale blue and partly purple), partly red and partly green dock seeds, geranium leaves lacking chlorophyll, sorrel leaves, plantain leaves, and a synthetic diet lacking plant pigments. Two sets of samples were fed on each foodplant, one set being reared in otherwise normal conditions, the other in darkness to ascertain whether, if foodplant colour did have an effect on larval colour, this was due simply to the ingested material or to whether the actual colour of the food might be causing a colour change response by stimulating the larval ocelli or some other sensory receptor.

The results showed that with the exception of those fed on pansy, rhododendron, very pale pink/white rose, geranium and synthetic diet, the majority of the larvae in each sample assumed a colour similar to that of their food. The colour of the larval frass varied considerably, but in most cases seemed to be influenced by the colour of the foodplant.

Larvae fed on mauve rhododendron assumed a dark green or turquoise colour, whilst those fed on pansy became pale green or yellow-green in colour. Those fed on very pale pink/white rose petals, chlorophyll deficient geranium leaves, or the synthetic diet assumed a very pale-ochre or yellow colour. Microscopic examination indicated that this was due to cuticular and epidermal pigments.

The samples reared in the dark gave similar results to those reared in normal light conditions. It therefore seems that the effect of foodplant on the colour of larvae is not influenced by any sort of visual stimulation.

Finally, a number of larvae from other stocks were fed on sorrel during the first instar, and transferred on to other foodplants about 24 hours after their first larval ecdysis. These larvae changed colour, assuming a colour similar to that of the new foodplant soon after commencing to feed on it. The colour changes in these larvae began at the anterior end of the insects and proceeded down to the posterior end. This feature, coupled with the fact that fresh frass in most cases was more or less similar to that of the foodplant, indicates that larval colour in early instars is due mainly to the colour of the gut contents. Obviously, the overall appearance of the larvae will also be affected by

the colour of the cuticular, epidermal and other pigments, but these are usually pale in colour, and at least partly translucent.

The results used to determine the nature of the larval colour variation and the data from the tests on the effect of environment implied that larval colour in the later instars must be controlled genetically. To investigate this possibility 67 broods from light trapped females were reared. All these initial broods and a large number of subsequent broods were reared under similar conditions still showed wide variation in colour in the third and subsequent instars, both within a single brood, and between broods, a genetic mechanism of control was indicated. Analysis of the results of the initial broods and subsequent control crosses, has led to an explanation of the larval colour variation in later instars which is based upon five unlinked major genes, and involves a complex system of epistatic interactions.

I will not explain here the method by which this mechanism was worked out, but will simply outline the mechanism.

For reasons of convenience it was decided to split up the six colour types found in the later instars into two groups, and as many broods contained no yellow larvae of any sort, it was hoped to initially work out the mechanism controlling the green, brown and olive types (Gr, Br, OL complex), and then to look into the situation behind the three yellow colour types (PY, YG, YB complex).

It was discovered that genes at three separate loci are involved in the Gr, Br, OL complex. Firstly there is a biallelic gene B showing incomplete dominance, which controls fourth instar colour, and in some cases may also affect third and fifth instar colour. The alleles b' and b^O when homozygous give green or brown larvae respectively, the heterozygote producing olive larvae.

Secondly, there is a biallelic gene C having complete dominance, where the dominant allele c^+ produces larvae whose colour is determined by the larval foodplant colour. The recessive allele c causes the effect of gene B to be initiated at the start of the third instar. Thus, for example, $ccb'b^O$ produces larvae which are olive in both the third and fourth instars whereas $c^+c^+b'b^O$ or $c^+cb'b^O$ both produce third instar larvae in which colour is foodplant controlled and thus usually green in the wild, and olive fourth instar larvae. It should also be noted that in green larvae where the allele b' is expressing itself, the shade of colour is not affected by the foodplant, so a larva which is $ccb'b'$ is green in both the third and fourth instars, but in neither of these instars is the shade affected by the foodplant.

Finally, a third biallelic gene A, again exhibiting complete dominance acts in the fifth instar. The dominant allele a^+ produces brown fifth instar larvae, whilst the recessive allele a causes no colour change between the fourth and fifth instar leaving the colour under the control of gene B.

The PY, YG, YB complex involves two additional loci. The first of these, gene D, is biallelic with complete dominance. The dominant allele d^+ leaves larval colour under the control of genes A, B and C. The recessive allele d causes the production of yellow pigment, at the start of the fourth instar if c^+ is present or at the beginning of the third instar if c is homozygous. The second additional locus involves a triallelic gene E. The alleles of this gene have been termed e^+ , e' and e^0 which are codominant to one another. The allele e^+ has no effect on genes A and B. The allele e' is epistatic to b' , that is to say it prevents the expression of b' and so prevents green pigment being produced and expressed in the later instars. Similarly, e^0 is epistatic to b^0 and a^+ , preventing the production of brown pigment by these alleles.

d , e^0 and e' are hypostatic to the dominant alleles e^+ and d^+ ; in other words, if d^+ is present e^0 and e' will not be expressed even if e^+ is present and d will not be expressed even when homozygous. Therefore the only genotypes which will produce larvae of any of the yellow colour types are $dde'e'$, $dde'e^0$ and dde^0e^0 .

The genotype $dde'e^0$ always produces plain yellow larvae in the fourth and fifth instars (as well as in the third instar if c is homozygous) as d produces yellow pigment and e' and e^0 prevent the occurrence of green and brown pigments respectively. $dde'e'$ produces yellow-brown larvae in the fourth instar (and third instar if c is homozygous) if b^0 is present in the genotype, or plain yellow larvae if b^0 is absent. In the fifth instar, $dde'e'$ produces yellow-brown larvae if either b^0 or a^+ is present in the genotype, otherwise again plain yellow larvae result. dde^0e^0 produces yellow-green larvae, in the third instar when c is homozygous and b' is present, in the fourth instar whenever b' is present and in the fifth instar when b' is present and a^+ is absent, otherwise plain yellow larvae result.

One other form was noted in one brood. 14 of a brood of 31 fourth instar larvae were of a green-pink ground colour, changing to the brown form at the start of the fifth instar. I have not found this green-pink form at any other time, and can find no previous record of such a form. It is suggested that this form is inherited as a monogenic dominant and that it may be allelomorphic to b' and b^0 . However, due to its rarity the green-pink form is not considered to be an important part of the larval polymorphism, and it is probably only maintained in the population by recurrent mutation.

The system controlling larval colour is surprisingly complex if it has evolved directly through selection for colour, and it seems probable that the genes concerned have other functions. Ford (1955) notes that there are reports that the green and brown larval forms of *P. meticulosa* tend to rest upon those parts of the foodplant which they match. If any of the predators of the larvae use colour vision to find the larvae, then it follows that any system which causes a closer match between

larval colour and resting substrate would increase the crypsis of the larvae and so be selectively advantageous.

It has already been shown that larvae in the 1st or 2nd instars, together with those 3rd instar larvae which have c^- in their genotype, have developed a system which causes a very close match between larval and foodplant colour. This system involves larval colour being controlled by the colour of the food eaten. However, in larvae of later instars this system does not operate, as colour is under complete genetic control and is not affected by foodplant. If, then, larvae of *P. meticulosa* do habitually rest upon those parts of the foodplant that they match, a behavioural system which is controlled, at least in part, by one or more of the major genes controlling larval colour seems the most likely explanation of the habit.

To investigate this possibility, a series of experiments were devised to test whether there were any behavioural differences correlated with larval colour type which might increase crypsis.

The results from these experiments showed that there is a change in larval behaviour correlated to the genetic mechanism controlling larval colour.

It was discovered that in the first and second instars larvae are photopositive, i.e. they are attracted towards light. On the other hand, fourth and fifth instar larvae show a photonegative response. Third instar larvae which have the allele c^- in their genotype (i.e. third instar larvae in which colour is foodplant controlled) are photopositive, while those which are homozygous for the allele c (i.e. those in which third instar colour is genetically controlled), are photonegative.

Michael E. N. Majerus (4027)

(To be continued)

REFERENCES

- COCKAYNE, E. A., 1928. On larval variation. *Proc. S. Lond. Ent. Nat. Hist. Soc.* (1927-1928): 55-67.
- FORD, E. B., 1945. *Butterflies*, Collins, London.
- FORD, E. B., 1955. *Moths*, Collins, London.
- LONG, D. B., 1953. Effects of population density on larvae of Lepidoptera. *Trans. Roy. Ent. Soc. Lond.*, **104**: 543-585.
- MAJERUS, M. E. N., 1978. The Control of Larval Colour in *Phlogophora meticulosa* L. (Lepidoptera: Noctuidae) and some of its consequences. Ph.D. thesis, Royal Holloway College: University of London.
- MAJERUS, M. E. N., 1978. The Genetics of Larval Colour Variation in *Phlogophora meticulosa* Linn. in the Ringwood area of Hampshire. In preparation.
- MAJERUS, M. E. N., 1978. Differential Behaviour in the Larvae of *Phlogophora meticulosa* Linn. correlated to larval colour. In preparation.

PAUL MINET REPRINTS

Paul Minet, an antiquarian bookseller, has reprinted several old books including a number of Natural History interest and at a price which is not only very reasonable indeed for the excellent quality of the

reprints but also represents but a fraction of the price some of the originals realise. Although the Entomological content of these books is small, they are of considerable general interest to Naturalists and well worthwhile bringing to the attention of members. Although sometimes available elsewhere, they are all obtainable from Picadilly Rare Books Ltd., 30, Sackville Street, London W1X 1DB at the prices shown, exclusive of postage. The following are at present available;

Natural History in Shakespeare's Time by H. W. Seager. This is an attractive book full of absorbing quotations from contemporary works, giving early sources and authorities for all the animals and plants mentioned in Shakespeare's works, illustrated with numerous contemporary woodcuts. Originally published in 1896. Demy 8vo. viii + 358 pp. Green buckram with dustwrapper. Price £4.50.

A Treatise on Domestic Pigeons by D. Girton. Only the second book ever published on pigeons, but nevertheless giving a good deal of information (much of which is still useful). Illustrated with a frontispiece and 12 engravings, to which has been added some modern photos for comparison, Demy 8vo. xii + 144 pp. Blue buckram. Price £3.50.

Falconry: Its Claims, History and Practice by G. E. F. Freeman & F. H. S. Salvin. Includes notes on training the otter and cormorant! This book consists of a collection of articles which were originally published in "The Field" in 1859. Crown 8vo. viii + 231 pp. Red buckram in dustwrapper. Price £4.00.

British Animals Extinct within Historic Times by J. Harting; with some account of British wild white cattle. This is still the only serious book on extinct British mammals and was originally published in 1880. With numerous engraved illustrations. Demy 8vo. x + 258 pp. Blue buckram. Price £4.00.

Essays upon Natural History and Other Subjects by G. Edwards. This book consists of essays and extracts upon a variety of subjects by Edwards, best known perhaps as a bird illustrator who nearly always included a butterfly or other insect on his plates as well. Originally published in 1770. Demy 8vo. viii + 231 pp. Maroon buckram. Price £2.00.

A Vertebrate Fauna of Lakeland by H. A. MacPherson. Includes Lancashire north of the sands as well as Cumberland and Westmoreland and is an exhaustive study of the fauna of the area, scrupulously accurate and still unrivalled after ninety years. Medium 8vo. civ + 552 pp. Many illustrations and folding map. Green Buckram. Price £5.50.

Observations on the Natural History of Swallows by T. Forster. Reprinted from the 1813 enlarged edition and includes some discussion

as to whether swallows hibernate or migrate. With five engraved illustrations. Demy 8vo. xvi + 97 pp. Maroon buckram. Price £2.00.

Early Annals of Ornithology by J. H. Gurney. Although published as recently as 1921, this is a scarce original and a mine of information as it covers ornithological literature from the 4th century onwards. It contains much information on the early history of rarer British birds. Illustrated with photos and engravings. Demy 8vo. vi + 240 pp. Price £3.50.

SOME UNPLEASANT BRAZILIAN FLIES

The "Berne" fly, *Dermatobia hominis*, of the *Cuterebridae* family, is $\frac{1}{2}$ inch in length, with a wing span of 1 inch. It has a grey-black thorax and a dull-blue abdomen.

The larvae of this fly live under the hides of various animals, principally,—as far as is generally known,—cattle and dogs, but also,—though not so commonly, fortunately,—humans.

To enable its offspring to find a home in the subcutaneous flesh of a living host, *D. hominis* has recourse to a curious expedient. To enable a newly-hatched larva to penetrate the hide of the host-animal a previously-made puncture in the hide is necessary. But the mouth parts of *D. hominis* are atrophied, and it can neither bite nor suck blood, and therefore cannot provide the required puncture. So, the female captures tiny biting, bloodsucking flies and mosquitoes and sticks her eggs on their abdomen. The eggs are thus transported over a wide range. Sometimes the larvae of ticks (*Amblyomma cajennense*), which cluster on the undersides of leaves and transfer themselves to passing animals, are also pressed into service as carriers by the "Berne" fly. Most commonly, however, the carriers used by *D. hominis* are the minute pin-head sized "Maruim" fly (*Culicoides* sp.) of the *Ceretopogonidae* family, known popularly as "Polvora" or "Gunpowder" flies, and the larger, almost $\frac{1}{4}$ inch long "Borrachudo", a *Simuliidae*,—*Simulium pruinosum*.

The tiny "Maruim" frequents swampy areas usually, but is also found in wet forests. In such places these minute bloodsucking flies appear in myriads. They inflict a sting bite, which usually draws a speck of blood and itches for an hour or so. Perspiration seems to invite these flies to bite, and commercial insect repellants seem to be of very little use in keeping them away. In swampy parts of Alagoas, Pernambuco and Paraiba,—constructing railway bridges,—I have frequently found it necessary to keep smoky green-wood fires burning near each gang in order to discourage the "Maruim" flies and make it possible to carry on working. Furthermore, some men carried small pots of burning oily cotton-waste as additional repellents, and strong cigarettes were smoked for the same reason.

“Borrachudos” do not appear in large swarms, and cigarette smoke is fairly effective in keeping them off. These flies frequent humid areas near flowing water, and are not usually met with in swamps. Their larvae live in fast-flowing streams, for which reason “Borrachudos” are mostly found in hilly regions. Their bites, which are felt immediately, produce blood-blisters, and itch for days.

Of course, not all the insects described are carriers of the “Berne” fly’s eggs; but when one which does happen to be carrying them bites its victim,—cow or dog or whatever, any larvae which are ready to hatch, helped by the warmth of the animal’s body, emerge from the eggs and enter the victim’s skin by way of the puncture made by the bite. Then they burrow into the subcutaneous flesh and in the course of some weeks grow to a length of $\frac{3}{4}$ inch and thickness of nearly $\frac{1}{4}$ inch before they drop off to pupate in the soil. In the case of human victims, the maggots are, of course, usually removed before they are fully developed.

I have seen cows in Minas Gerais with dozens or more swellings containing “Berne” larvae, and have seen three people, each with three “Berne” maggots in various parts of their bodies, and have met others in Pernambuco, Minas Gerais and Rio de Janeiro who told me they had been victims in the past, of “Bernes”. None had suffered any impairment to their health, in consequence, apparently.

The larvae are removed by lancing; or by applying greasy ointment over the orifice of each wound,—thus closing off the air supply to the larva, which then protrudes its rear end (where its breathing apparatus is located) to avoid suffocation. It can then be grasped by tweezers and extruded.

Some people are more unlucky than others, and a few who are seldom exposed to the bites of “Maruim”, or “Borrachudo” or other bloodsucking insects, become “Berne” victims, while a great many others who are very frequently bitten by these pests suffer no after-effects whatsoever, apart from the initial smarting, and itching caused by the bites.

T. C. Hanson (5242)

THE MOLE CRICKET

The Mole Cricket (*Gryllotalpa gryllotalpa* L.) is a large insect whose forelegs are greatly modified for digging purposes. It is brown in colour, and most of the body and legs are covered with fine velvety hairs. The forewings are much reduced in size, and do not cover much more than half the abdomen. The hindwings are fully-developed, and extend beyond the tip of the abdomen.

The female has no external ovipositor. There is very little variation in coloration, the body and legs being somewhat paler below than dorsally. In the rare brachypterous form the hindwings do not reach the tip of the abdomen.

Measurements—Male

Total body length: 35.3mm to 40.7mm (mean 38.13mm)

Length of forewing: 15.53mm to 16.5mm (mean 15.53mm)

Length of hind femur: 10.3mm to 11.5mm (mean 10.83mm)

Measurements—Female

Total body length: 40.6mm to 45.7mm (mean 42.16mm)

Length of forewing: 15.7mm to 17.5mm (mean 16.51mm)

Length of hind femur: 10.9mm to 11.9mm (mean 10.55mm)

Habitat

This rare insect is a lover of moist localities and it is usually found in the vicinity of rivers, streams, canals or ponds. The moist soil of water meadows or flood plains also makes an ideal environment. It was a very great surprise to me, therefore, to find one wandering aimlessly about in the corridor of a hospital in which I was working at that time, in Northampton. The date was 11th July 1970.

Life history

It has not been possible to carry out studies on the Mole Cricket in England because of its rarity, but on the Continent it has been studied extensively.

The eggs are laid from late April to early May, in an underground nest-chamber, the depth of which depends on the amount of moisture in the ground, but it is rarely more than one foot deep. In very moist localities nest-chambers may be found just beneath the surface of the ground. The eggs are laid over a period of 7-14 days in a heap on the floor of the nest-chamber. The number of eggs can vary from 100 to 300 or so, but occasionally as many as 600 have been recorded in one nest-chamber. It is not thought that more than one female has contributed to this number.

Parental care of ova and nymphs

The female guards the nest and periodically licks the eggs; this would seem to protect them from disease caused by mould-spores, as eggs rapidly develop mould if removed from the female's care. After about two weeks' from the date of laying (longer if conditions are cooler than normal for the time of year) the young nymphs emerge, staying in the nest for several weeks and feeding on humus, young root-lets and suchlike pabulum. They remain in the nest for the ensuing winter, still under the protection of the female, who guards them assiduously. The following summer the original parents continue to breed, but the young do not reach sexual maturity until the third spring following their emergence from the egg. The nymphs as well as the adults hibernate in the winter, usually in the same nest-chamber in which they have been living previously, but occasionally individuals have been found in other hibernacula. The Mole Cricket is the longest-lived of all Orthoptera.

Habits

As its name implies, the Mole Cricket spends most of its time underground in its burrow, but in warm spells in spring, summer and early autumn it will spend part of its time above the surface of the ground, usually at dusk or after nightfall. If it should be very warm, it will frequently take to the wing, although it is not a strong flier. The flight is very clumsy and noisy.

One surprising characteristic of the mole cricket is that it can run backwards, both in the burrow and above ground.

Food

The mole cricket is omnivorous, feeding on roots, dead leaves, humus, insects, grubs, thysanuroids, pupae, collembola, etc. In a few places (on the Continent) the mole cricket causes a great deal of damage to root crops such as carrots and potatoes.

Song

The song consists of long bursts of subdued churring noises, which may be heard only on warm evenings and nights in the spring, from mid-April onwards. The male often sings at the edge of his burrow, in the presence of the female, as part of his courtship display, during the course of which he will swing his wings down by the side of the abdomen, swaying to and fro to attract his mate's attention. This display can continue for an hour or even longer. The insects then mate, the male depositing sperm in the female's genital aperture.

Distribution

The Mole Cricket is distributed all over Europe, mainly in the southern and south-western parts. It used to be widely-distributed in England, but is now a great rarity.

The specimen I found was sent to the Monk's Wood Experimental Station together with a record of the date and place of its occurrence.

David A. Tilley (5206)

SOME OBSERVATIONS ON CONTINENTAL RHOPALOCERA IN ITALY (TUSCANY REGION)—MAY 1978

During the two weeks between 14th and 27th May 1978 I spent with my family a self-catering holiday in a modern attractive villa set amongst stone pine trees (*Pinus pinea* L.) lying within a few hundred metres of the sea along the sheltered coast lying to the west of Castigilione della Pescaia. This region of the Tuscany west coast of Italy is perhaps less frequented by English tourists than the more popular and developed coast line lying to the north between La Spezia and Livorno and is therefore less affected by the constant human erosion which has so adversely affected much of the Italian coast line. The Isle of Elba lies close to this area of Tuscany although this island is not clearly visible from this part of the coast.

The local terrain was predominately hilly with extended inland areas of garigue and maquis vegetation. Much of this terrain was difficult to traverse without following rough tracks and fire-breaks, which were never too difficult to find in the course of my local wanderings. Much of the lower ground area was under cultivation, which at first caused me some concern in view of the regularly sited notices along the roads and tracks forbidding shooting, hunting and even trespassing! I soon found, however, that the local farming families appeared to take little interest in any foreign invader on their land, although I have to admit that I did not attempt to trespass much beyond well defined tracks and field borders so as to reduce the risk of embarrassing encounters with local rustics! Many of the hill tracks were strewn with spent cartridge cases, which at first puzzled me until I discovered that during the winter and early spring months every Italian who possesses and can use a gun does so with abandon in such areas. This is perhaps a sad reflection on our modern times and would account for the rapid removal of much of Italy's wild fauna.

It was soon apparent to me that due to an extended bad winter and heavy rain during the early part of the year, much of the flora and insect life was very late to appear, and my visit proved to be far less fruitful than would normally have been the case, although I was rewarded by finding many early orchids and flowers, which normally would have been sighted three to four weeks earlier in the year. The general freshness of Spring with so much colour present was indeed a rewarding experience. The weather conditions around the coast were good and sunshine was generally present almost every day with temperatures in the upper 60°F region during most afternoon. Inland weather conditions were however more variable and we encountered heavy rain storms in the Siena district during one visit.

As so few species of butterfly were recorded throughout my visit I propose setting out my general observations under family group headings as follows:—

Papilionidae

I. podalirius L. was sighted on three occasions in flight at the top of a small hill near Castiglione, and on one occasion I was fortunate enough to witness the courtship dance carried out by one pair. This involved a swift spiralling flight together with the aid of local thermal currents around the hill with a sudden downward flight often involving a complicated chase across the hillside and back again to one particular cistus bush close to hand. On reaching this bush the female would often land on an upper exposed twig, where she would remain for some minutes with wings extended and would allow me to stalk up to her within a few centimetres before being disturbed. Although she was a rather worn specimen, I was able to photograph her with some effect. Her male companion seldom came to rest and appeared to be quite

content by flying close at hand in a strong zig-zag pattern before the two insects resumed their courtship flight. All imagines sighted were clearly spring brood insects and were generally in good condition.

Strangely enough although *podalirius* was clearly not uncommon in this region, I only encountered one fine male *P. machaon gorganus* Fruhst. in flight during the morning of our last day. This insect was seen in fast flight along a small track in the hills lying immediately behind our villa. Although fennel was quite plentiful in waste areas around fields and hills, I never found ova or larvae. I can only deduce therefore, that this species was only just appearing on the wing and the general late appearance was entirely due to adverse earlier weather conditions.

Pieridae

Few representatives of this family were present, which greatly surprised me despite the general late appearance of all butterflies sighted. Three somewhat worn male *G. cleopatra europaea* Verity were recorded as seen in flight close to our villa during the second week of our holiday and one of these was caught and examined, but released in view of its worn condition. No female imagines were ever sighted, and this species was never seen in the hills behind Castigilone where much of my observations took place. I can only conclude that owing to the general worn condition of those found, this is a species which is generally on the wing somewhat earlier than our visit.

Amongst the more sheltered thickets around paths and small streams I frequently encountered a few male and female *L. sinapis* L. imagines fluttering around. Most specimens appeared to be in good condition and I concluded that my visit had fallen at the height of the appearance of this species.

Only one male *C. crocea* Geoffroy imago was sighted in flight amongst the sand dunes adjacent to the local beach and this insect appeared to be in good condition. Strangely enough no further sightings of this species were recorded throughout my visit.

During a visit into the hinterland on one morning in the first week of the holiday whilst I was in the midst of photographing a species of orchid, a male *E. ausonia crameri* Butler flew past me across a meadow, and after much exertion I succeeded in netting this insect, which was found to be in reasonable good condition, although I suspect it had been on the wing for some days. At no other time was this species ever recorded although I feel sure that it is widely distributed throughout Tuscany and is certainly likely to be encountered during this period of the year.

Within a few minutes after capture of the above mentioned butterfly I sighted what I thought to be another specimen, only to find that this was in fact a freshly emerged female *A. cardamines* L. imago, which I immediately released after capture. Although I never sighted a male of

this species, I am certain that such could have easily been found with a little more sustained searching.

Nymphalidae

Few species of this family were recorded, and this was almost entirely due to earlier adverse weather conditions having delayed emergences in general. However, I was delighted to find *L. reducta* Staudinger present in small numbers sailing and soaring along sheltered paths around the base of many hills visited wherever dappled sunlight was present. Both male and female imagines were recorded, and I found that this species was particularly abundant around noon on sunny days. Although I have encountered this species in the South of France many years ago, I had not recorded its presence elsewhere during my Alpine holidays, and I was therefore, pleased to be able to record its existence once again. This species is particularly graceful in flight and I spent much time simply standing in the middle of the path and watching this attractive butterfly flying up and down in a searching manner before finally coming to rest on exposed branches of small cistus or strawberry tree bushes flanking the path. This butterfly was rarely seen to alight on any bush higher than 1 metre and so I was afforded the opportunity to photograph this attractive butterfly.

On a few limited occasions a single *V. cardui* L. imago was seen in fast flight along the sea shore or around the edges of cultivated land.

A. urticae L. and *V. atalanta* L. were likely to be present in this region, although I never recorded a sighting as such of any imago of either of these two species.

Amongst fritillaries I only recorded finding *M. phoebe* Schif. at a roadside area amongst a grove of sweet chestnut saplings twenty kilometres north of Castiglione in a hilly district. All specimens were male and were freshly emerged and rather small in size. However, the general colouration was particularly fulvous with regular black markings. This species is probably widely distributed throughout Tuscany and elsewhere and is perhaps more likely to be encountered from early May onwards as a multi-brooded butterfly.

Satyridae

Within a day or so of our arrival I stumbled across my first *C. corinna elbana* Staudinger imago fluttering close to the ground within a waste area close behind our villa. This is in fact a somewhat local sub-species, and apart from being found on the Isle of Elba, it is found locally on the Italian main land along coastal regions close by. In fact I found this sub-species to be quite common and widely distributed in the hills during the second week of our holiday and both male and female imagines were recorded as being present. Having found the nominate species in Sardinia two years before, I was particularly interested in comparing the differences between this and ssp. *elbana* and I readily noticed that the ocelli present on the underside of the

hind wings of *elbana* were distinctly larger and more uniform in character than those displayed by the nominate species. In other respects the differences were variable, although the general colouration of the upper sides of both fore and hind wings of *elbana* tended to be distinctly more fulvous than its Sardinian counterpart.

Within the more sheltered and shady areas amongst maquis thickets in the hills *P. aegeria tircis* Butler was to be found in small numbers. I was surprised to find this northern form present in such a southerly latitude as I would have expected to have found the more common southern species *P. aegeria aegeria* L., which was found to be so common in Sardinia. Furthermore, most specimens were small and variable in size with one recorded female imago as having a fore-wing span between apex and base of little more than 15 mm.

No other species of this family were recorded at any time.

Lycaenidae

The most widely distributed species found in the hills was *G. alexis* Poda which was found on most days flying around waste ground areas and paths wherever leguminous plants were growing. Both male and female imagines were recorded and caught and the general size and wing span was very variable. One male imago caught had a fore-wing span of little more than 10 mm. Most imagines were in good condition and I concluded that this species was fully on the wing at the time of my arrival.

S. pirithous L. was also present in small numbers in exposed hillside areas wherever the terrain was stony and lightly covered with sparse vegetation. So far as I was able to deduce however, only male imagines were present, although the general worn condition of many imagines made sex evaluation very difficult. This species is a strong flier in bright sunshine.

L. boeticus L. was also present in small numbers in similar terrain to that as described above. Both male and female imagines were recorded and I found many to be in good condition. Owing to the fast and determined nature of the flight of this insect, it proved to be very difficult to sight, and the male imagines in particular rarely settled more than a few seconds at a time. I spent much energy in catching a few imagines I wished to collect!!

P. icarus Rot. was guaranteed to be found in limited numbers in lowland areas and those imagines which were found, appeared to be in good condition. Only males were recorded.

In the more mountainous area of Tuscany towards Monte Amiata (1738 m.) I found a male *C. rubi* L. avidly feeding on a large patch of thyme. This somewhat surprised me as we were well above 1000 m. and the weather conditions were cool and the over-all vegetation was more in character to that of early Spring in April with little or no foliage present amongst the deciduous trees. Another male imago of this

species was also encountered at a much lower altitude nearer to the coast, flying around a large Spanish broom bush (*Spartium junceum* L.). Despite the obvious disparity between the altitudes concerned and the vegetation present in these two localities, it is clear that this species is widely distributed and can be found anywhere during this period of the year.

Amongst the "coppers" I found only one male *L. phlaeas* L. imago flying around wasteland behind our villa during the first week. At no other time was this species encountered.

Although my own personal observations were limited due largely to the poor weather conditions earlier in the year throughout northern and central Italy, my disappointment at finding so few species on the wing was more than compensated by the beauty of the local countryside, the uncrowded beaches and the general unhurried pace of life found to exist in the hill-top villages. The Italian countryside is certainly far more attractive at such a time of year with the added advantage that the ugly stamp of tourism has not imprinted itself along the coast and more popular inland sites of beauty. A further visit to the Tuscany region during May or early June in another year when perhaps Spring is a little more advanced would prove to be more rewarding—but then I doubt that one would be so lucky as to see the beautiful Pink Butterfly orchid (*Orchis papilionacea* L.) with its delicate, but stately blooms amongst the cistus scrub in the hills, which for me more than compensated the lack of butterfly life!

Nigel F. Gossling (5169)

INSECTS IN THE ARDENNES, SEPTEMBER 1978

A mainly dull and rainy fortnight spent back-packing in the Ardennes during early September would seem superficially to be an unpromising way of collecting and observing Insects. Indeed, the trip started inauspiciously for having hitch-hitched to Calais from Cambridge on the first day, we were dismayed at the French drivers unwillingness to provide lifts, and so spent two days in Calais. These later proved, much to our annoyance, to be the hottest days of the entire trip.

The Calais campsite and its environs provided no surprises amongst the Lepidoptera: *Hipparchia semele* L., *Lasiommata megera* L., *Pieris brassicae* L., *P. napi* L., *P. rapae* L., *Polyommatus icarus* Rott., and a solitary *Celastrina argiolus* L. Tiring rapidly of Calais roadsides, we caught a train to Charleville-Mezieres in the Ardennes region of north-east France, arriving at dusk. The next day, still quite bright, saw us climb Mont-Olympe (a lowly hill in spite of its imposing name) overlooking the municipal campsite. Lepidoptera proved surprisingly scarce in spite of the profusion of flowers, although a single *Thecla betulae* L. was caught, as well as *Coenonympha pamphilus* (L.) *P. megera*, and the three common Pierids. More diverse were the Orthoptera, these in fact

being the most abundantly found group of the whole fortnight. *Tettigonia viridissima* L., *Leptophyes punctatissima* (Bosc.), *Conocephalus dorsalis* (Latreille), a *Metrioptera* sp., and three species of Acrididae were all found. One *viridissima* was found lying dead on the road to the camp-site — this “habitat” being quite a fecund source of specimens in several areas which we visited. (Another reflection of French drivers?)

Quitting Charleville after two days, we caught a local train further down the Meuse valley to Revin, towards the Belgian border. We then went *à pied* up the valley slopes to a campsite near Les Mazures. The 7 km. walk up an horrific gradient in (for once) sweltering heat left little inclination to admire the roadside insects, numerous though they were; the Umbellifers in particular swarming with Diptera and Hymenoptera. The roadside death toll included numerous *Gonepteryx rhamni* L. and many *Geotrupes* spp. Amongst the ‘survivors’ were the attractive Cerambycid *Strangalia maculata* (Pod.) and the Orthopterans *Metrioptera roeselii* (Hagenbach) and more *viridissima* — noticed chiefly due to their persistent chirping.

“Le Camping”, when found, consisted of gravel-carpeted roads and tent-spaces, carved out of the sloping landscape in a young Birch and Ash forest. The highlight of our two very wet days here was a glimpse of ‘Le Morio’, *Nymphalis antiopa* L. The only other Lepidopteran seen here was *Lymantria dispar* L.

The return hike to Revin was enlivened by the capture of another Coleopterous Bee-impostor, this time *Trichius fasciatus* (L.), and also by a lift, albeit of only 2 Km.

Backtracking towards Charleville-Mezières by train, we chose as our next base a tiny stop called Joigny-sur-Meuse. The site, on the very banks of the Meuse, was beautiful, but the weather again disappointed, grey skies, wind and drizzle predominating. It was surprising then that more Insects should be found here than anywhere else that we visited — this area must be inestimably rich during the peak of the summer. Resorting to the improvisational techniques of the ever-resourceful entomologist, we used a plastic survival bag as a beating tray, obtaining by this method quite a profusion of Insects. The Orthoptera were represented mainly by cockroaches, resembling most nearly *Ectobius lapponicus* (Olivier), though slightly too large; also present were *Mecanema thalassinum* (Degeer) and more *L. punctatissima*. *Aromia moschata* (L.) was the best of the rather scanty Coleoptera. The Coccinelidae seemed to specialise in being present as single specimens only: *Thea 22-punctata* (L.) *Coccinella 10-punctata* (L.), *Exochomus quadripustulatus* (L.), *Calvia 14-guttata* (L.), and a *Rhyzobius* sp. were all recorded from solitary individuals. Only *Coccinella 7-punctata* L. was at all inclined towards gregariousness, a handfull being seen.

Ignoring the blustery weather, we decided to explore the sloping woods and rich meadows bordering the tow-path on the opposite bank of the

barge-infested Meuse. The numerous Acrididae included *Chorthippus parallelus* (Zetterstedt) and *C. brunneus* (Thunberg). A number of familiar Chrysomelids were also found, many perched atop grass stems in the rain-soaked meadows and verges. *Timarcha tenebricosa* (F.) abounded amongst lesser numbers of *Chrysomela distinguenda* Steph., *C. haemoptera* L., *Galeruca tenaceti* (L.), and a *Cassida* sp.

The finest day at Joigny (The only one warm enough to bring out any Lepidoptera) produced sightings of *rhamni*, *icarus*, *betulae* and *antiopa* (keeping well out of reach), plus the ubiquitous Pieridae, with *Lasiommata maera* (L.) new to the list, as were *Plusia gamma* (L.) and a battered *Callimorpha quadripunctata* Poda. The beautiful damselfly *Agrion splendens* (Harris) also took to the wing.

Investigating the woods on one dull but dry day, I was struck by the large number of crickets in the leaf litter and on the low vegetation. All were *Nemobius sylvestris* (Bosc.). Many Cockroaches (*Ectobius* sp.) were also seen, particularly on Bramble. A new Orthopteran to me was a light grey ground-hopper (Tetrigidae) found under a stone. Stones and logs generally however were surprisingly unproductive, newts, toads and snakes sometimes outnumbering Insects! The Carabids *Badister bipustulatus* F. and the pretty *Agonum dorsalis* (Pontoppidan) were the only species identified. Searching under bark produced one item of interest, some of the extraordinarily dorso-ventrally flattened Bugs of the family Aneuridae. Seen on the same occasion was a massive Ichneumon, almost certainly *Rhyssa persuasoria* (L.), which unfortunately evaded capture. In contrast, a remarkable piece of good fortune struck that afternoon, as we walked along the edge of the wood in dull, windy conditions. Something on the path caught my eye, the object much to my surprise being a fine female Purple Emperor, *Apatura iris* (L.). She was still alive but already being investigated by a few foraging Red ants. The chance of making such a find must be very small indeed.

Miscellaneous single Insects found around Joigny during our stay there included the Large Marsh Grasshopper *Stethophyma grossum* (L.) and the Common Ground-hopper *Tetrix undulata* (Sowerby). The Sallow Moth *Xanthia togata*, Esp. completes the round-up of Lepidoptera, whilst the only notable Hymenoptera were two large Ants (11 mm. long) beaten from Brambles within a wood, and a Hornet (*Vespa crabro* L.) found dead in Joigny station. Following three days of almost continuous drizzle, we decided to curtail our visit and headed back for Calais by train. Upon my arrival home, I discovered that the specimens, which had been kept in small metal tins packed with tissue paper, were still in a relaxed condition, owing to the pervading dampness of the holiday, which had infiltrated even these supposedly secure containers. Fortunately none of the insects succumbed to mould, and so I finished with quite a respectable collection, augmented by some Carabidae from a lay-by on the B 1379!

ADVENTURE TO DARKEST AFRICA THE WILDS OF SIERRA LEONE

(Continued from page 148)

During our stay in Sierra Leone, we (Mrs Caswell, Jim Brady, and myself) did a good deal of travelling — mainly thanks to a missionary we knew there, by the name of Bill Roberts, who was very kind, and took us to many places in his car, and also provided us with 'guides', who knew the areas well, and were able to take us to all sorts of places we would never have gone to otherwise, — including one whole day, spent walking around tiny African villages out in the country, where white people were rarely seen. (In fact we didn't see a single white person for about nine hours on that particular day). One day, we set off on a two day trip to Bo, which is 150 miles away, which may not sound very far to people living in England, with fast motorways, but 'out there' 150 miles is a long trip, over roads which are often covered with thousands of huge potholes, so vehicles have to swerve about from one side of the road to the other. Also unless you travel in a private car, it is impossible to travel by public transport (usually rather battered old coaches) to any town, and return again the same day, — for the coaches all leave for their destinations about nine-thirty a.m., and if you happen to want to return again, you have to wait until the next day. This is due to the fact that it takes most of the day to get anywhere, as the roads are so bad. The vegetation is very lush in many areas, especially after the rains, which end about the end of September, and one of the commonest trees there is the acacia. These grow everywhere, and some of them are really huge,—but although acacia is one of the main foodplants of many African silkmoth larvae in England, we could not find any larvae of any kind on acacia in Sierra Leone! We believe this may have been due to being a bit late for collecting larvae. The beginning of the wet season is apparently much better, and we were told by a number of people that 'at certain times of the year, there are lots and lots of huge larvae and moths'.... Other common trees are banana, coconut trees, orange trees, and many kinds of fruit trees, — grapefruit, paw-paws, mangoes, and of course there is the famous giant cotton tree, right in the centre of Freetown, but this tree is in the middle of a round-about! A very common plant found everywhere there, is the sensitive plant, — so called because when the leaves are touched, they close up instantly. This plant grows rather like grass does in England, covering large stretches of ground in places. Grass, by the way, is not all that common, and usually where there is grass, it is not like the grass we know, but grass with very wide blades. Mentioning the commonest plants, reminds me of the commonest butterfly found there, — one surely and instantly recognisable by most members of the A.E.S., — our Painted lady butterfly! These could be seen everywhere we went, though of them many were in rather poor condition, — perhaps

because they had been out for some time. Incidentally, one of the Painted lady butterflies landed one day on Mrs. Caswell's foot, and just would not go away. When chased, it simply went round in a circle and landed on exactly the same spot again! I just happened to have my camera with me at the time, so I got a nice photograph of it sitting on her shoe.

A common day-flying moth found there, was a species of burnet, which had the most wonderfully coloured body, — stripes rather like a wasps body, but in many different colours. For those interested in lizards, Sierra Leone is the most perfect place they could go, — for lizards can be seen everywhere, sitting and sunning themselves in the hot sunshine, chasing each other along the paths of the hotel, — or sitting on top of rocks. They seemed to prefer places near human habitations, for it was near buildings of any kind that most lizards of all could be seen, — even right in the centre of Freetown itself, with the busy traffic speeding by only yards away. One huge lizard was seen about one mile from our hotel, running across a muddy track. It must have measured at least a couple of feet long, and moved at a very fast rate into the dense vegetation. Geckos likewise, as earlier mentioned, are very common everywhere, and nearly every house we visited had at least one or two sitting about somewhere either half-way up a wall, or perhaps across the ceiling catching flies as they landed. In the evening these geckos would often appear in large numbers, both inside and outside houses, and they were usually quite 'tame' — though we didn't in fact try and catch any, — but we could have done so quite easily if we had wanted to. Geckos in fact do a great deal of good, eating up all sorts of flying insects and mosquitoes, so people do not try and get rid of them. Lizards on the other hand, would have been almost impossible to catch, for they ran about at a terrific rate, and it was rarely possible to get anywhere near them.

Then one morning, some two weeks after our arrival in Sierra Leone, our very first saturnid moth appeared, — not in our light trap, but sitting on one of the cement supports of the hotel, and only yards away from my bedroom! At first all I noticed was what looked to me like two pieces of string, hanging down outwards from this cement support, but as I got nearer I quickly saw that it was the most beautiful silkmoth, — almost completely pink in colour, not very large for a silkmoth, having a wingspan of perhaps three inches, — but from its 'rear' wings, it had the most wonderful pair of 'tails' I've ever seen on a moth of its size, being about six inches long, and in quite good condition. Not having a box with me, — for it was around nine a.m., and I was on my way to breakfast, — I made a hasty return to my room, got one of the huge supply of plastic boxes which we had brought for just such an occasion, — and within minutes, the moth was safely in the box. Unfortunately it turned out to be a male, — had it been a female we might have hoped for dozens of ova, and the chance of seeing what the larvae of this strange moth looked like, — but I suppose one male silkmoth is much better than

no silkmoths at all! This moth was in fact a species of *Eudaemonia*.

Then another day we walked along by the coastal road, and after a while took a path going in towards the mangrove swamp. We followed this path until we could go no further, for at the end of it was the rather horrible looking swampland and muddy water, — probably the breeding ground for many mosquitoes. (Don't worry, we had been well vaccinated against all sorts of diseases, such as smallpox, cholera, yellow fever, and were on a course of anti-malarial tablets!) Hear, by the side of the swamp, dozens of little mudskippers, — a kind of fish which have front legs, and can breath on land, — could be seen everywhere, — often coming up out of the water, and crawling along on the mud but at the slightest movement they were back again in the safety of the muddy water, and with their other companions,—hermit crabs, tiny fishes and all sorts of other 'creepy-crawlies'.

It was about an hour or so later we had returned to the 'safety' of the road, that we found that it was not all that safe, — for walking along on the beach, beside the road, a huge African lad appeared from nowhere, and very quickly, and unexpectedly, relieved us of a flight bag we had with us, which contained such items as a cheap camera, various other odds and ends, including a sun-glass case — but not the sun-glasses!, and also some plastic boxes and tins, which contained larvae and other insects which I had collected during that morning. Don't know what he must have thought of those when he examined his loot, it would certainly have been quite a picture to see his face. Also in the bag was a certain amount of money, which no doubt he found very useful. Fortunately we were fully insured, and have since got the value of most of the items stolen back. (So if you're thinking of going to Sierra Leone next year or at some future date, be warned, — make sure you are well insured!)

On the sand of the beach where this incident occurred, huge spider crabs raced about everywhere, and when disturbed, would dive down into large holes in the sand.

For those interested in birds, ... of the feathered variety, ... there were lots of huge vultures about, especially in the towns, and there were the most beautiful tiny humming birds, which fed as they hovered besides flowers, — sometimes we nearly caught one of these by mistake, for they were very like butterflies, — in fact they were much smaller than some of the butterflies there, and they were a beautiful iridescent blue/green colour.

And so our stay during most of October in Sierra Leone came all too quickly to an end, and we had before us, what turned out to be a trip of over twenty hours travelling, by coach, ferry, plane, coach, and taxi for we landed first at Dakar, in Senegal, which is one hour's flight away. Then after spending the whole night 40,000 feet up, including an evening meal, and breakfast at four a.m., we were told that our plane

had been diverted to Manchester airport instead of Gatwick, — so we had a long coach ride back to London, in what to us was 'freezing cold' (though in actual fact quite warm for very late October), but having spent weeks in a place where the temperature rarely drops below the eighties, and often it was in the nineties, it certainly seemed cold to us.

Wesley Caswell (3133)

A PRELIMINARY SURVEY OF THE FOOD AND FEEDING HABITS OF ADULT BUTTERFLIES (SECOND SUPPLEMENT)

(Continued from Vol. 36. page 94)

Assimilation of Dry Food by Fluid Recycling

Many butterflies obtain food from sources other than flower nectar. Mineral salts and other organic materials are apparently necessary for some species. It is also accepted that the insect can only absorb food in the liquid state, i.e. through the proboscis. It comes as rather a surprise that there are records of butterflies probing dry substances with their proboscides, e.g. dry honeydew, dry mud etc.

Various species of Diptera feed by salivation, that is depositing a globule of saliva on the food and re-absorbing it with the food in solution, and according to Rennie (1830), Swammerdam in the 17th century apparently first observed what he thought to be salivary ducts in *Aglais urticae* L. More recently experiments carried out by Downes (1973) in Canada with *Heodes phlaeas* L. *Phyciodes tharos* Drury and *Polygonia comma* Harris, fed in the laboratory on dry animal tissue, were seen to exude saliva from the proboscis on to the food, which was then re-absorbed by suction. The cycle of outflow and withdrawal of saliva was repeated 10-20 times in as many seconds. In this way the surface of the food is repeatedly washed with saliva, the soluble materials liquified and re-imbibed. No doubt this is what happens in nature, but it is obvious that very close observation would have to be made to witness this happening in the field.

Other species recorded at dry food sources include *Fenisica traquinius* Fabr. and *Danaus plexippus* L. both imbibing dry perspiration on the human body: *Libythea celtis* Laieharting at dry mud, and I have personally seen *A. urticae* probing with its proboscis on dry honeydew deposited on the leaves of the wild cherry (*Prunus cerasus*) but did not realise its significance at the time.

In contrast, the Hesperioidea seem to adopt another method of dealing with dry food sources. This is a more obvious one and more easily observed, and which I have witnessed on quite a few occasions. It is the deposition of a minute globule of clear liquid from the depressed tip of the abdomen on to the dry food source, turning round and re-absorbing it through the proboscis. I have had this experience

more than once with *Ochlodes venata* B. & G. settling on my arm and performing as described above. Simes (1938) also makes the same observation with the same species. Other skippers, species of *Pyrgus* and *Spialia* have also been recorded elsewhere behaving similarly. This method also appears to extend to the nearly related giant skippers (Megathymidae) in North America. Hessel (1966) observed at least six examples of *Agathymus aryxna* Dyar feeding in this manner from a dry rock, adjacent to a stream where large numbers of the same species were drinking.

From these few records one cannot be dogmatic in saying that one method of fluid-recycling is exclusive to the Papilionoidea and the other to the Hesperioidea, but that of the former would appear to be the more advanced method and in keeping with the position of the Papilionoidea in the evolutionary scale, relative to the more primitive Hesperioidea.

B. R. Stallwood (1547)

REFERENCES

- DOWNES, J. A. (1973) Lepidoptera feeding at puddle-margins. *J. Lepidopterists' Soc.* **27**, 91-2.
HESSEL, J. H. (1966) Fluid recycling in *Agathymus aryxna* *J. Lepidopterists' Soc.* **20**, 242.
RENNIE, J. (1830) *Insect Miscellanies* **3**, 38 (Charles Knight, London).
SIMES, J. A. (1938) *Proc. Roy. Ent. Soc. Series A*, **13**, 80.

NEWS ITEMS FROM HABITAT

Conservation Will Be Minister's Main Priority

Mr. Michael Heseltine in his first major speech as Secretary of State for the Environment has given a firm undertaking that his Department will promote a strong conservation policy, in spite of reductions in public expenditure. Speaking at a luncheon at the Portman Hotel in London on 13th June 1979, Mr. Heseltine said he could not stress too heavily that in all the work of his Department it was "concern with the environmental pollution that was the unifying factor". He said that unless there was better use of land in towns and cities pressure on the countryside would grow. Already 30,000 acres of countryside were lost to urban development every year but he was determined that green belts would be protected and preserved.

Turning to habitats, the Minister said that more had to be done to preserve these and to "reconcile conservation of the countryside with demands of modern agriculture, forestry and leisure activities". He cited the effects of draining wetlands; enlargement of fields by hedge removal and clearance of small woodlands; ploughing up of permanent pastures; infilling of ponds and ditches; and the injudicious use of fertilisers and pesticides as being particularly harmful. He added that "aquatic wildlife, by nature fragile and sensitive, suffers from a range of injury and disturbance, such as deepening, straightening and em-

bankment of rivers; or the enrichment of water by nutrient chemicals, reducing its capacity to support life".

"And then there are the effects of leisure and recreation not only on wildlife but on the very scenery that people have come to enjoy. There are an important range of policies here for the conservation of our countryside and wildlife to which I attach the highest importance".

Still on the question of wildlife, Mr. Heseltine then spoke about action required in the international arena. The UK would maintain a leading position such as on the implementation of the Washington Convention on International Trade in Endangered Species of Flora and Fauna, the Ramsar Convention on Wetlands of International Importance, the EEC Directives on the Conservation of Wild Birds, the proposed Bonn Convention on the Conservation of Migratory Species of Wild Animals and the Council of Europe Convention on the Conservation of Wildlife and Natural Habitats.

New Bill To Protect Wildlife And Habitats

Lord Skelmersdale's Amendment Bill to the Conservation of Wild Creatures and Wild Plants Act 1975 was withdrawn at its second reading on 21 June and it has since been reported that the Government intend to bring forward a Bill affecting comprehensive legislation on the protection of wildlife generally. This will cover international obligations with regard to the EEC Bird Directive, the protection of plants, animals, wetlands and habitats and include provisions for the former Country-side Bill.

Hedges And Local History

This booklet, reprinted this year, was issued as a result of a one day conference held jointly by the Standing Conference for Local History and the Botanical Society of the British Isles in 1971. It covers the implications of the possibility of dating hedge-banks from their constituent vegetation from methods developed by Dr. Hooper of Monks Wood Research Station by a simple count of certain plant species within the hedge. Other contributions are made by Professor Hoskins, Professor Bradshaw and Mr. Allen. It is hoped that the publication of this type of material will encourage local historians and botanists towards joint studies of hedge banks. Price £1.10 inc. postage it is available from Bedford Square Press, National Council of Social Services, 26 Bedford Square Press, London WC1B 3HU.



Exotic Entomological Specimens

LEPIDOPTERA — COLEOPTERA — MISCELLANEOUS INSECTS

Livestock of Saturniidae, etc.

Please write for details of our lists, etc.

R. N. BAXTER

**16 BECTIVE ROAD, FOREST GATE, LONDON, E7 0DP
ENGLAND.**

For a personal and interested service

Member of the Entomological Suppliers' Association

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Othoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

Annual subscription — £6.50.

Write for specimen copy to E. H. Wild, 112 Foxearth Road, Selsdon, Croydon, Surrey, CR2 8EF enclosing 60p. This amount will be taken into account in the first year's subscription.

A LEPIDOPTERIST'S HANDBOOK

Written by Richard Dickson, this is a practical Guide to the breeding, collecting, storing, conservation and photography of butterflies and moths. It provides a first-class introduction for the beginner and an up-to-date reference book for the initiated.

A.E.S. Volume No. 13, 136 pp., sewn sections, 34 line drawings, 13 plates. Published 1976. Price £3.00.

Obtainable from **A.E.S. Publications Agent,**

129 Franciscan Road, Tooting, London, S.W.17 8DZ

(Do not send any money with your order, an invoice will be sent with the publication)

"...having read it from cover to cover, I can strongly recommend it." THE ENTOMOLOGIST'S RECORD.

BRITISH ENTOMOLOGICAL & NATURAL HISTORY SOCIETY

Illustrated Papers on British Microlepidoptera

The Society announces the publication shortly in one volume of twelve articles reprinted from the "South London" Proceedings between 1944 and 1957 with the 12 original colour plates.

These papers comprise LAMPRONIIDAE & ADELIDAE, LITH-OCOLLETIS, and OECOPHORIDAE (3 parts) & ALLIED FAMILIES by S. N. A. Jacobs; PSYCHIDAE, PLUTELLIDAE and GLYPHIPTERYGIDAE & ALLIED GENERA by L. T. Ford; CALOPTILIA and LYONETIIDAE by S. C. S. Brown; ERIOCRANIIDAE & MICROPTERYGIDAE by J. Heath and MOMPHA by S. Wakely. For ease of use the pages and plates have been renumbered and are fully indexed accordingly; in addition there is a new appendix drawing attention to species belonging to these groups which have been added or sunk. There is also a list of species which relates names used in the text to up-to-date nomenclature and classification.

A **limited** edition of 500 copies is being published in the Autumn of 1978. The book will be bound in cloth. Price: £9; **£6 to members of the Society.** Postage where applicable 60p extra.

Copies may be obtained from: Hon. Treasurer, R. F. Bretherton, Esq., Folly Hill, Birtley Green, Bramley, Surrey.

SPECIALIST A.E.S. HANDBOOKS

Volume
No.

7. **The Hymenopterist's Handbook.** Originally published in 1943, facsimile reprint 1969. This volume is a comprehensive guide to collecting, rearing and the study of ants, bees, wasps, sawflies, gall-wasps and parasitic Hymenoptera; including keys to all the British families.
160 pp., 183 figs., 2 plates. Price : £3.00
9. **Practical Methods and Hints for Lepidopterists.** Containing articles on rearing and collecting larvae; illustrated instructions for making beating trays and cages for all entomological purposes.
42 pp., 48 figs., 6 plates. Price : £1.00
11. **A Coleopterists's Handbook.** Describes the tools and methods for collecting British beetles; their habitats, commensals and pre-adult stages; how to record, photograph, make a personal collection, and conduct a local survey. Based on the original, 1954 Edition, this volume is a comprehensive guide to collecting and recording British Beetles.
142 pp., 62 figs., 18 plates. Price : £3.40
12. **A Silkworm Rearer's Handbook.** By W. J. B. Crotch. How to breed 120 exotic species in Britain, including substitute foodplants and descriptions of stages. Systematic section refers to 1400 species. Does not deal with the Mulberry Silkworm (*Bombyx mori*), q.v. Leaflet No. 3.
165 pp., 26 figs., 24 plates. 2nd edition 1956. 2nd facsimile reprint 1979.
with colour plates omitted. Price : £5.00
14. **Insect Photography for the Amateur** by P. E. Lindsley. A practical guide on the subject, describing all necessary equipment and accessories for macro-, micro- and general insect photography and the methods to be used. 8 plus 52 pp., 10 figs., 11 plates. Published 1977. Price : £2.00
15. **A Dipterist's Handbook** by A. E. Stubbs, P. J. Chandler and others. A practical handbook for both the beginner and the initiated on collecting, breeding and studying the two-winged flies. Describes equipment, trapping, preservation, habitat, plant and animal associations, behaviour. Includes a chapter on larval stages with an illustrated key to the families. Detailed appendices give records from a wide range of sources brought together for the first time. An essential book for the keen dipterist.
260 pp. with line drawings illustrations of larvae and equipment. Price : £6.00

From A.E.S. PUBLICATIONS AGENT
129 Franciscan Road, Tooting, London, S.W.17 8DZ

Do NOT send any money with your order. An invoice will be sent
with the publication.

2nd Midlands Entomological Fair and Exhibition

HOLIDAY INN - NICHOLAS CIRCLE - LEICESTER
SATURDAY, APRIL 12th 1980

11-0 a.m. until 6-0 p.m:

ADMISSION 20p (Children under 12 - 10p)

EXHIBITS AND SALES OF PAPERED SPECIMENS,
LIVESTOCK, BOOKS, EQUIPMENT, etc, etc.

*A special attraction will be a Flight Cage
featuring birdwing butterflies*

Ample Car Parking in adjoining N.C.P. multistorey

Enquiries : Jack Harris, 3 Bradgate Drive, Wigston Fields Leics.

Tel : (0533) 883998

Q Naturalist Enterprises

69 Marksbury Avenue, Kew, Richmond, Surrey, England
Tel. 01-878 5771

**WE SUPPLY LIVING AND PAPERED MATERIAL
OF WORLD WIDE SPECIES**

Our wish is to offer stock of fine quality
in an honest and friendly manner

HAVE YOU TRIED US

We can offer you livestock and papered specimens to suit the
young collector/breeder and rarely offered species
to the specialist at competitive prices, and of choice quality

WE ARE HAPPY TO BUY/EXCHANGE LIVESTOCK

Spring/Summer livestock/papered list issued
February of each year
Specialist list issued throughout the year

Please send for our new list
Specialist £0.70 per annum. Send S.A.E. for sample list

